June 9, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 39

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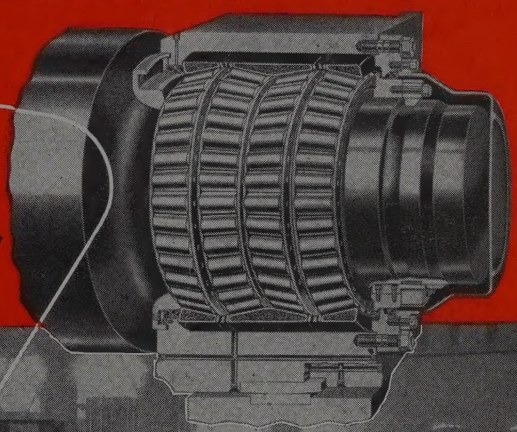
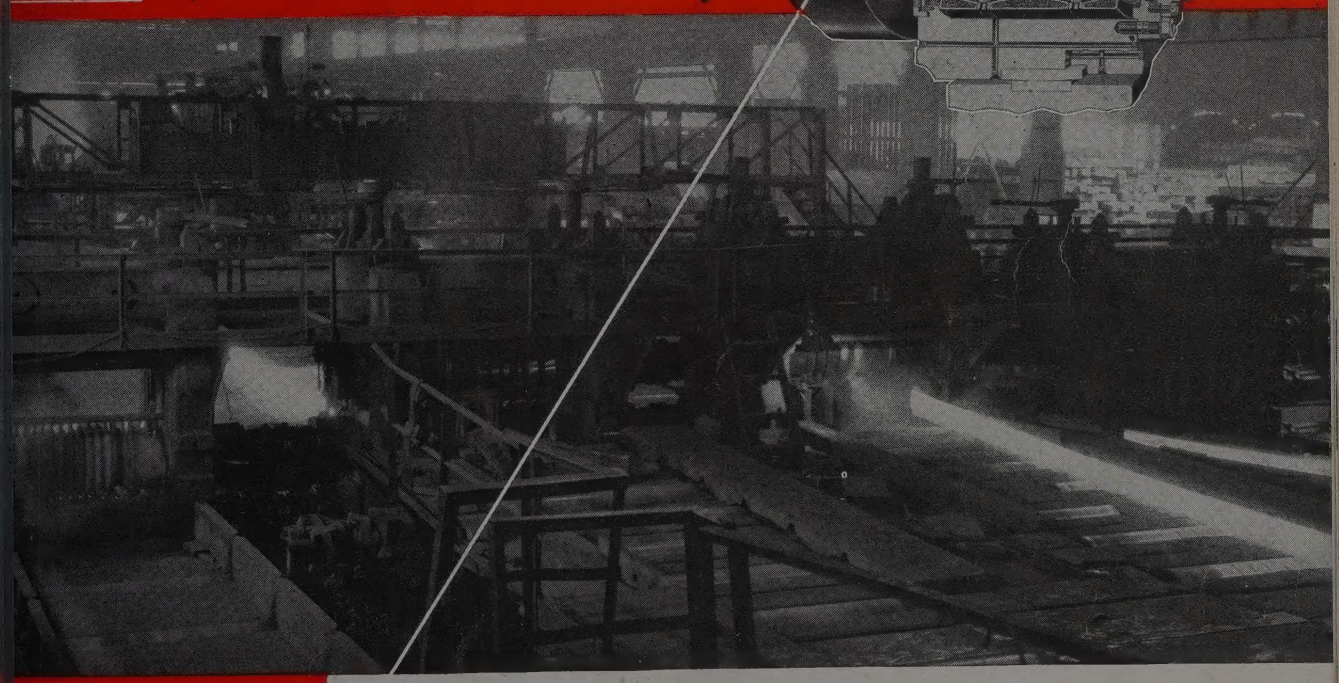
First On Roll Necks
foremost today





e Proving Ground of
nken Roll Neck Bearings.

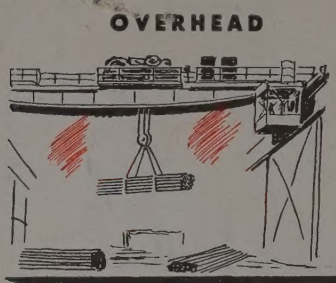
IMKEN
TRADE MARK REG. U. S. PAT. OFF.
LL NECK BEARINGS

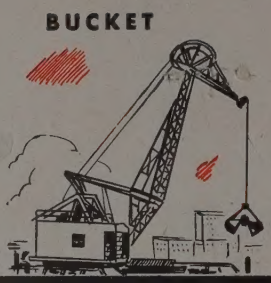
Timken Roller Bearings were first applied to mill roll necks more than 20 years ago and, logically, the proving ground of Timken Roll Neck Bearings was The Timken Roller Bearing Company's own steel plant.

Here the pioneer bearings received their initial testing; here, in conjunction with a constant program of engineering and metallurgical research they were developed from the experimental stage to practical, dependable products that could be offered to the steel industry as a sure means of increasing production and reducing costs on rolling mills of all types — hot and cold.

Throughout the many years of development of Timken steel mill bearings, we constantly have anticipated new rolling mill trends and requirements. Thus, some time ago, it became evident that far greater strength and rigidity would be demanded in the rolling mills of the future. We therefore set to work to develop a roll neck bearing which, while possessing all the characteristic advantages of existing roller bearings, would permit the use of larger diameter roll necks and thus greatly reduce roll neck stresses and deflection.

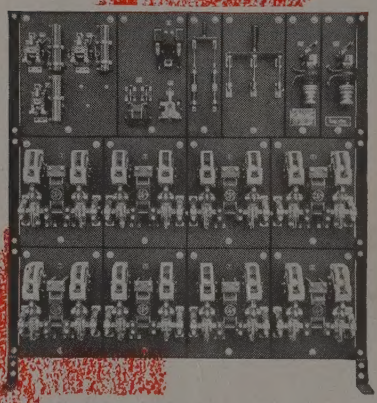
The result was the Timken Balanced Proportion Bearing destined to have far-reaching and revolutionary effects, not only on mill roll necks, but wherever anti-friction bearings are used. The Timken Roller Bearing Company, Canton 6, Ohio.





COMPLETE ELECTRICAL CONTROL

FOR ALTERNATING CURRENT CRANES



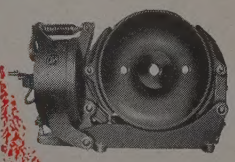
Moving loads quickly and spotting loads accurately are two of the many features which have made EC&M Magnetic Control famous wherever a-c cranes are used. Bulletin 930.

For many years, EC&M has led in the development of extremely sturdy, highly efficient electrical equipment for cranes . . . equipment that meets the requirements of good cranes.

EC&M engineers have designed into this equipment that extra margin of safety and quality which insures uninterrupted service . . . which also includes features appreciated by maintenance men and operators as aids in their daily tasks.

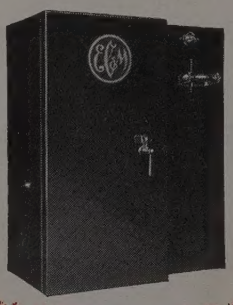
Many users recognize the symbol, EC&M, as a standard of value and specify this equipment whenever new cranes are purchased or when revamping existing installations. These users know that control, only a small part of the initial cost, is a vital part of every crane.

They know, too, by experience, it pays to standardize on EC&M Control for cranes.

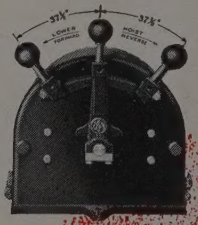


To stop and hold the load, EC&M Brakes solve the a-c brake problem. Rectifying equipment is usually mounted on the magnetic control panel. Optional arrangement is in a compact enclosure for separate mounting. Bulletin 1006.

To prevent overhoisting, enabling the operator to do better work by removing the fear of an accident from his mind—Youngstown Safety Limit Stops. Bulletin 1032.



Crane protection—a single unit containing overload relays, knife switch and push-button-operated main line contactor. These Protective Panels provide low voltage protection to the entire crane and permit disconnecting power to all motors in an emergency. Bulletin 1022.



Speed control master switches — cam type and of narrow width to permit close mounting of several in front of the operator within easy reach. Short throw from off to full-on position reduces motion by the operator. Bulletin 1190.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

Published for your information

THE NEW, COMPLETE LIST OF AISI STANDARD STEELS

The new list of the standard steels approved by the American Iron and Steel Institute as of April 16, 1947 has been published in pamphlet form by Bethlehem Steel Company.

This 8-page pamphlet gives the latest AISI numbers with the revised chemical compositions of the new standard grades including all—

STANDARD ALLOY STEELS
STANDARD CARBON STEELS
STANDARD RESULPHURIZED CARBON STEELS

If you are a materials engineer, a metallurgist, a designer, a purchasing agent—anyone who specifies or uses steel in any form—you will find this up-to-the-minute list of considerable value. Write today for your free copy of *AISI Standard Steels.*

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

If you are located in the far West address your request to

BETHLEHEM PACIFIC COAST STEEL CORPORATION, SAN FRANCISCO

BETHLEHEM STEEL

USE A SHAPER FOR JOBBING

CINCINNATI Shapers have great power, lasting, built-in accuracy and exceptional versatility for jobbing work.

They will do the job the economical way, practically without jigs, or fixtures or special tooling. Quick setup from job to job cuts time and costs.

They are handy, busy, profitable tools in the jobbing shop.

Write for Shaper catalog N-3.

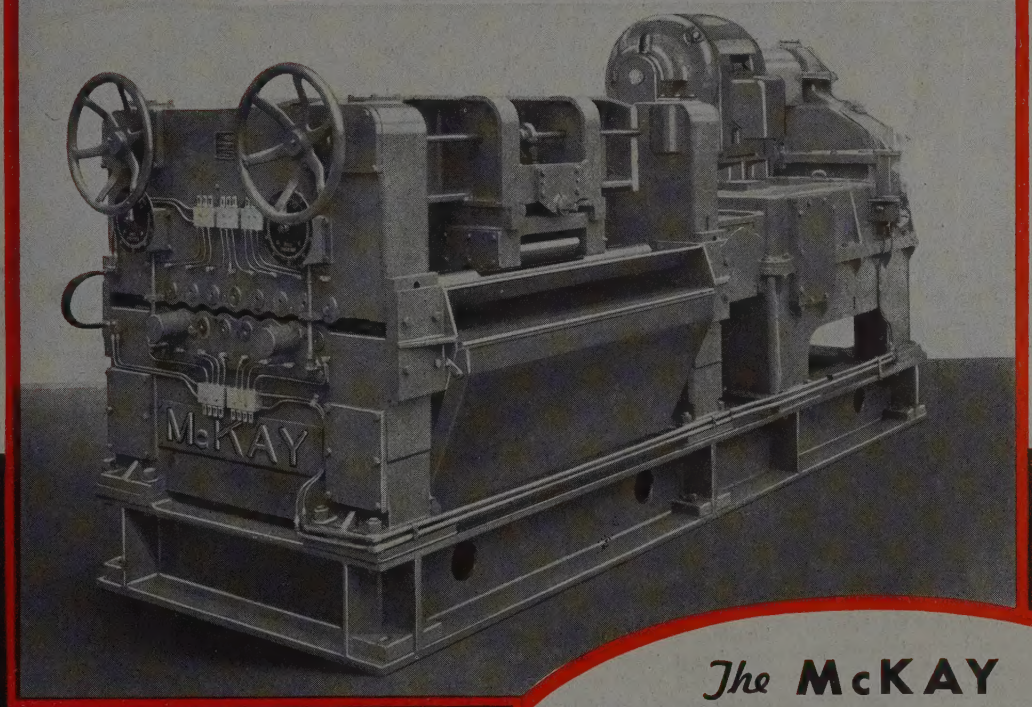
THE CINCINNATI SHAPER CO

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

McKAY

BACKED-UP ROLLER LEVELERS



FEATURES

ct design reduces required
ace.

ustments are readily ac-
to the operator.

e indicating dials are pro-
or the screwdowns.

Alloy steel Helical gears are used throughout—fully enclosed and running in oil.

Drive is through Universal couplings.

One-shot lubrication system.

Rugged construction insures continuous performance and low maintenance cost.

The McKAY

Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

The McKAY MACHINE Company

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

ASSOCIATED COMPANY The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

PERFORMANCE
RUGGEDNESS
PRECISION AND
SAFETY

Behind the Scenes...

Back In Business

Back in our April 21 issue we commented on the fire at Accurate Spring Mfg. Co., Chicago, and the story written by Phil S. Hanna of the *Chicago Daily News* about how everybody helped get this outfit back in business. We note now that in last week's book on page 39 the Accurate Spring people reproduced this Hanna column in its entirety as a means of thanking publicly all the people who cooperated in the effort to get them back in production. We think it is not only good advertising on the part of Accurate, but also a very fine gesture on their part to extend a "thanks" to all who helped out in the emergency. A barrel of roses to the Accurate people responsible for this ad, and to their agency, Russell T. Gray Inc., Chicago.

Hubbard's At Bat

This being the June 9 issue, you will find the first of a series of eleven articles on the general subject, "How to Cut Costs and Increase Production with Modern Machine Tools," on page 74. Written by our Machine Tool Expert, Guy Hubbard, as will be all the articles in this series, the current article covers the subject of turning. These eleven articles, plus last week's story on the Machine Tool Show, are part of STEEL's editorial contribution to the importance of the machine tool story this year. There's good stuff to be gleaned from these articles, so don't miss them!

Business or Pleasure?

Have you heard about the smart lad who was being interviewed for a job by a top-flight executive of the metalworking industry? Well, seems that the big executive looked sharply at the smart lad and asked, "Do you indulge in intoxicating beverages?" The lad pondered a couple of seconds and then asked if before answering the question he might himself ask a question. "Of course," said the big brass, "go ahead." "Well," said the smart lad, "is that an inquiry or an invitation?"

Hootnanny Hoots

From down in the Southland, where he is currently selling subscriptions on our behalf, Gary Hewitt reports he has uncovered a new product of the metalworking industry. Called a Hootnanny, it is a strange double jointed extendable gadget on wheels which fits a dire need of America's farmers. Seems the thing is used for carrying unwieldy farm machinery from place to place, is made from steel tubing which can be telescoped so as to fit the machine to be hauled, and is equipped with a winch to lift the machine off the ground. Seems like the manufacturer might find the Hootnanny is the answer to some industrial hauling problems, and with a name like that, it wouldn't be hard to get a lot of free publicity, just like this.

Puzzle Answers

Well, the ginks and firkins problem seemed to be meat for a number of you. First correct answer came in from Ralph Pappenheimer, Cincinnati. If we had a few extra firkins, we'd send them along to him to stuff and put in his trophy case. According to Mr. P., the reason he managed to get the correct answer and quickly is because his outfit, like a lot of others, has time on its hands while waiting for steel. Fortunately, he doesn't have to wait for STEEL, because shortages or no, it's on his desk every Monday morning, along with 19,999 other copies just like it, which are on desks all over the country and 'round the world—although some of these distant ones can't make their goal by Monday. Oh, yes. The answer! It's 3 ginks and 6 firkins.

New Puzzles

This week's puzzle bears a strong family resemblance to some of our recent twisters. Seems that a kind old man with a big jug of whiskey offered to fill for free any cup which could be made from an 8-inch circle of paper formed into a cone. One of the takers was a mathematical genius with a great thirst, so after some figuring, he was able to come up with a cup larger than anyone else. Can you figure out what was the circumference of the circle which formed the lip of his cup?

Pulled Up Short

Is this the bottom of our space we see looming directly below? And we had hoped to find a small spot for the poem about the expediter sent in by E. G. Schwinn of Dayton, who was inspired by our purchasing agent's lament of a few weeks back. Well, we at least had good intentions—even if we couldn't squeeze it in.

Shrdlu

(Editorial Index—page 39)

STEEL
Vol. 120—No. 23 June 9, 19

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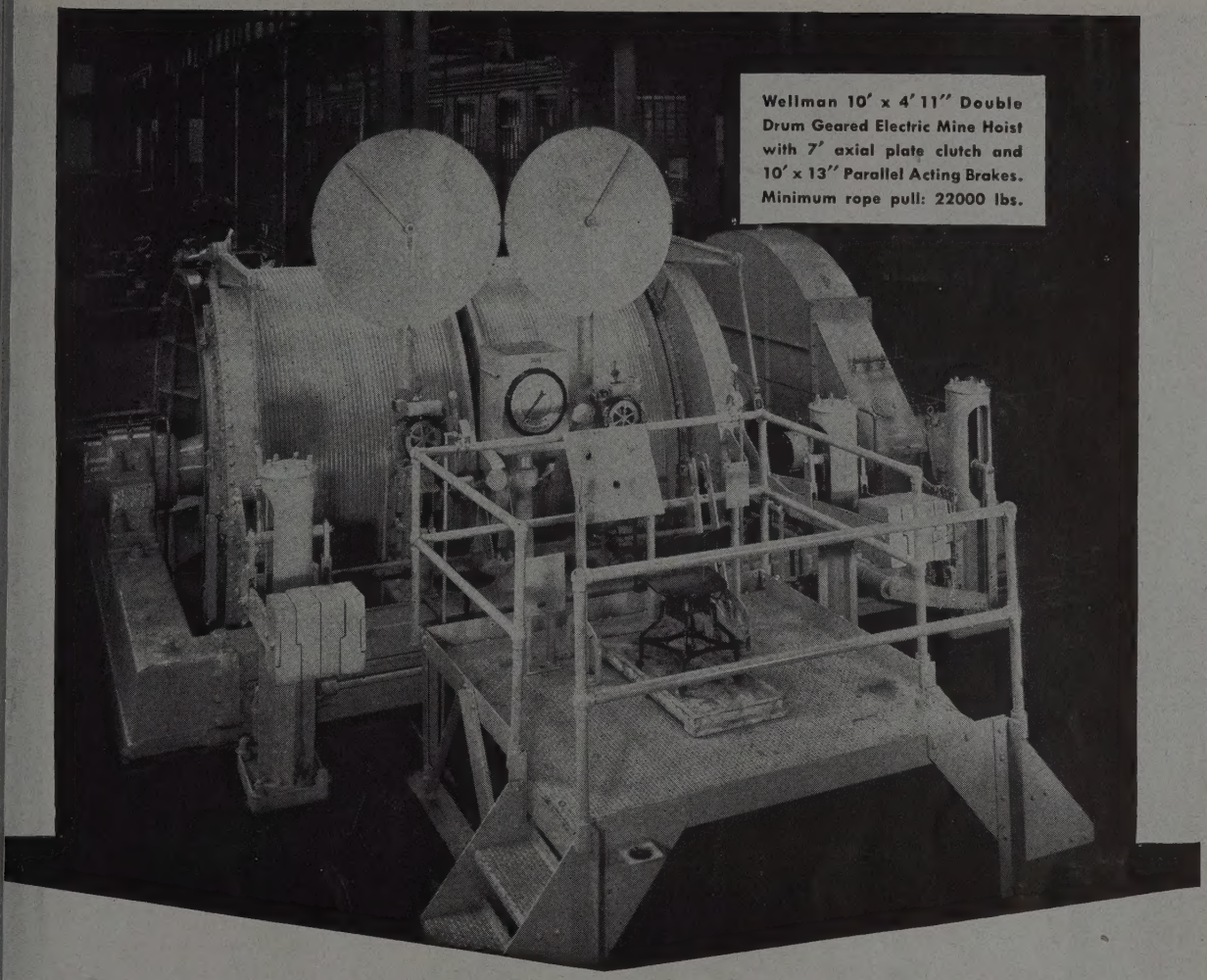
Editorial Staff on Contents Page



Wellman 10′ x 4′ 11″ Double Drum Geared Electric Mine Hoist with 7′ axial plate clutch and 10′ x 13″ Parallel Acting Brakes. Minimum rope pull: 22000 lbs.

WELLMAN ELECTRIC MINE HOISTS

Designed by Specialists • Built by Specialists

INSURE PEAK EFFICIENCY

WELLMAN
WILL BUILD IT!

Car Dumpers (all types)	Industrial Furnaces
Ore and Coal Handling Bridges	Coke Pushers
Gas Producers	Mine Hoists
	Charging Machines
	Soaking Pits

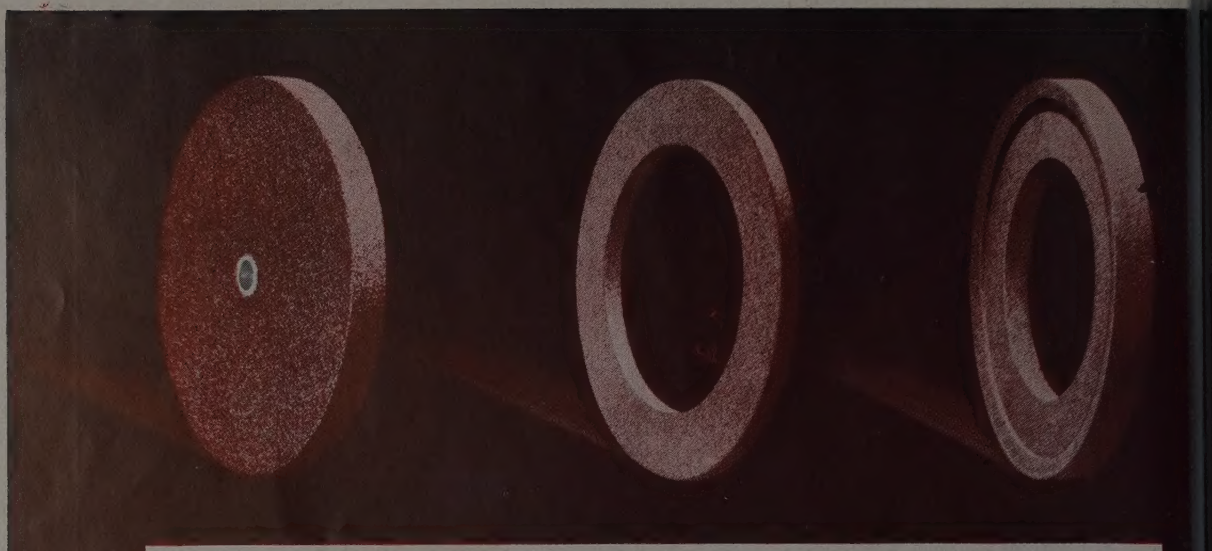
Skip Hoists
Special Cranes (Wharf, Dry-Dock, Hammerhead, Pontoon)
Clamshell and Dragline Buckets

WELLMAN Electric Mine Hoists are used in mines all over the world. Backed by half a century of diversified experience, they incorporate the best and latest principles of design and construction and provide maximum safety with economical, trouble-free operation.

Wellman hoists have been built in a wide range of sizes to operate under a wide variety of conditions. Ask us for recommendations on your job!

THE WELLMAN ENGINEERING COMPANY

7029 Central Avenue • • Cleveland 4, Ohio



Production really rolls with job-designed wheels

Are you interested in speeding up production—in smoothing the rough edges on your grinding bill?

Then consider your grinding wheels. Production really rolls when you use the *right* wheels. But production creeps and falters when you use *wrong* ones. And it all shows up on the records.

For 58 years, men in your industry have been getting the right wheels and faster production by consulting Peninsular.

Call in Peninsular engineers on your job. They will study your grinding thoroughly. From this study, they will develop job-designed grinding wheels for best possible results at lowest possible costs. *Every* Peninsular grinding wheel is specially made for its particular job.

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7, *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

PENINSULAR

INDIVIDUALLY PENINSULAR *ENGINEERED*

GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID BONDED WHEELS

This Peninsular "wagon wheel" has a rim which is a stand grinding wheel for rough grinding, the hub is a portable grinding wheel, and spokes are crankshaft balancing wheels.

Hanna Valves

. . . put precise control of mighty muscles at your finger tips

Hanna Unitite Valves are designed and built to give long, trouble-free service. They are quick-acting, packless and permanently tight. Except for periodic lubrication they require no maintenance. They may be used as 3-way or 4-way valves operating at air, oil or water pressures up to 250 psi. for the ⅜", ½" and ¾" sizes; up to 150 psi. for the 1" size and up to 100 psi. for the 1¼" size. They are available in three different styles for standard mounting, column mounting or manifold mounting.

Foot-Operated Valves

• Hanna Foot Operated Valves are available in single and double pedal models for use at pressures up to 250 psi., air or oil.

Speed Control Valves

• Hanna Speed Control Valves provide adjustable control of inflow as well as outflow of air and oil independently to and from one side of cylinder piston. Available in a variety of sizes.

Valve Bulletin

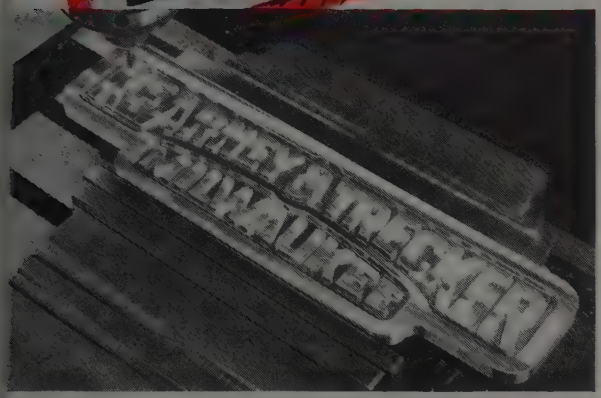
• Bulletin No. 235 gives operating and mechanical data on all Hanna Valves. Write for a copy.

Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT . . . CYLINDERS . . . VALVES . . . RIVETERS

1765 Elston Avenue, Chicago 22, Illinois

Here's How to Make a Name for Yourself —in 55 Hours!

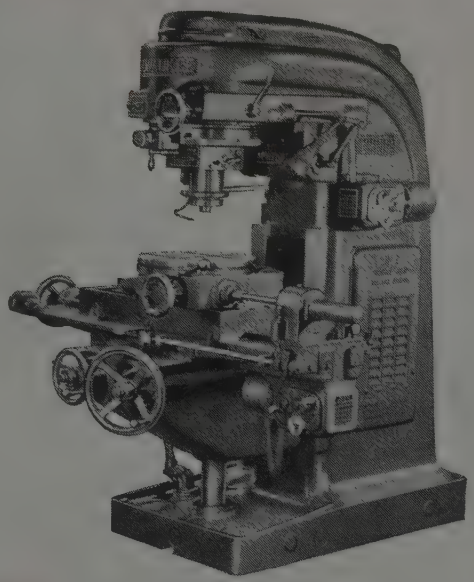


FAST! Here's 2 metal pattern jobs that ordinary methods take lots of time and effort to produce. Using a Rotary Head Milling Machine, they were simplicity itself. Operator accurately located each workpiece and one working center. The rest was simply following blueprints and simple arithmetic.

LAYOUT LETTERS, SPACES AND RADII EXACTLY AS ON DRAWING
NOTE THAT THE OUTSIDE LEGS OF THE "M" AND THE "E" IN
MILWAUKEE ARE 1/8 INSTEAD OF 1/4 WIDTH OF OTHER LETTERS
SPACING BETWEEN LETTERS AND BORDER 1/4 UNLESS OTHER-
WISE INDICATED
KEARNEY & TRECKER
MILWAUKEE

DIRECT! Regardless of jobs — pattern molds, tools, dies, hobs, cavity molds or production parts, the Rotary head milling machine transmits the blueprint dimension direct to the workpiece. No fussing with templets or models. Operator relies on simple, precise control of cutter and table movements.

ACCURATE! Machine features precision control of all cutter movements in any plane — enables operator to accurately locate and generate complex angles and contours. It reduces chance for error, because most jobs, even if somewhat large or complex can be completed in one or two set-ups.



The Kearney & Trecker-Milwaukee Rotary Head Milling Machine offers a conservatively estimated 35% savings in use on a major percentage of tool, die, mold, or production work within working range. For complete data write for bulletin 1002C

KEARNEY & TRECKER CORPORATION
MILWAUKEE 14, WISCONSIN

4722

National Seamless

FOR HIGH PERFORMANCE LONG SERVICE AND SAFETY

TODAY'S turbine-driven locomotives, super power plants and fast steamships owe much of their high state of development to the Seamless process of tube making. For, as temperatures and pressures went up, boiler tube metallurgy had to be years ahead to assure safe operation and lasting economy under increasingly heavy loads.

HIGHER CREEP STRENGTH. All steels used in U·S·S NATIONAL Seamless Boiler Tubes are of the completely "killed" type. That is, the steel is thoroughly deoxidized before being cast into ingots. Tests by impartial investigators have shown conclusively that "killed" steels have better creep strength at elevated temperatures than "rimmed" steels of similar chemical analysis commonly used for other types of tubes.

SUPERIOR HEAT TRANSFER CHARACTERISTICS. Seamless tubes made of "killed" steels have uniform density, freedom from laminations and soundness of structure throughout the metal walls. This

NATIONAL TUBE COMPANY · USS STEEL · UNITED STATES STEEL

NEW STEAM TURBINE LOCOMOTIVE *designed for maximum efficiency and reliability uses* NATIONAL *Seamless Boiler Tubes.*

UNITED STATES STEEL

Boiler Tubes . . .

provides superior heat transfer characteristics with less danger of "hot spots"—a worthwhile consideration in boiler tube service.

BETTER WORKING PROPERTIES. Tubes that can be readily bent, expanded, flared, beaded, and rolled tightly into headers or sheets without splitting or fracture have practical qualities that all boilermakers appreciate. These qualities greatly reduce construction and maintenance costs, and because U·S·S NATIONAL Tubes possess them to the highest degree, workmen prefer to install these tubes. Complete annealing gives the user a product that is neither too hard nor too soft but has just the right balance between strength and ductility for good performance and utmost ease of installation.

WALLS WITHOUT WELDS. There is no longitudinal weld or line of potential weakness to limit safe operating pressure. Each tube is a solid, homogeneous cylinder pierced from a billet of high quality steel. Service records from locomotive, stationary and marine boilers prove that *U·S·S NATIONAL Seamless Tubes* give longer, safer and and more economical service.

NATIONAL TUBE COMPANY

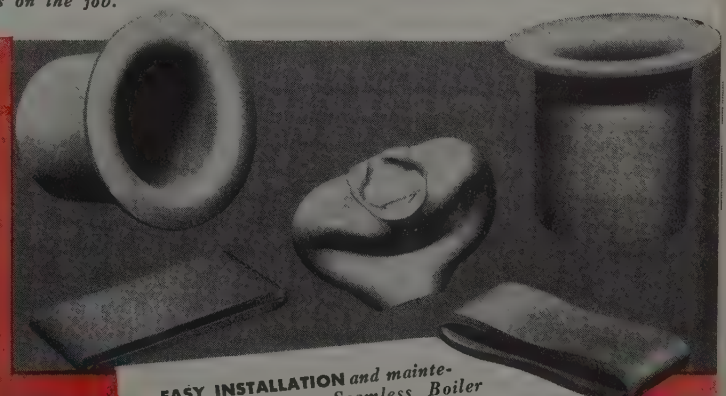
PITTSBURGH, PA.

Tubing Specialties Division

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

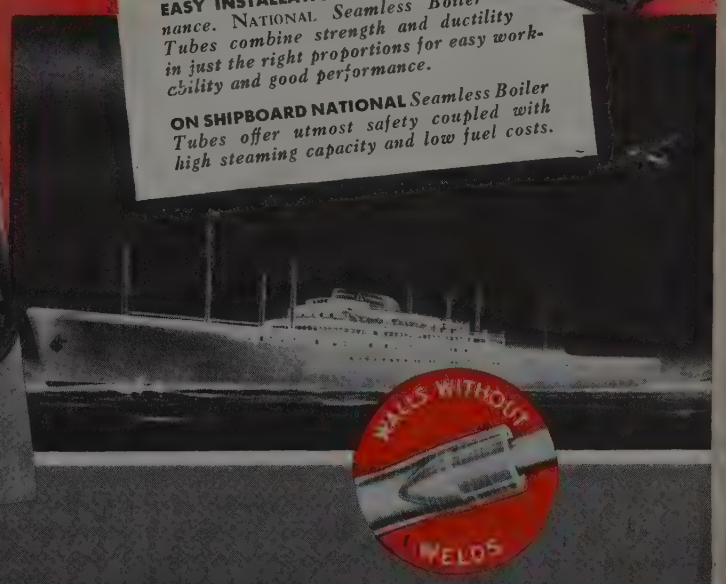
United States Steel Export Company, New York

SURE FIT. *In our mill, full-size tube layout for a stationary boiler assures easy installation of* NATIONAL Seamless *Tubes on the job.*

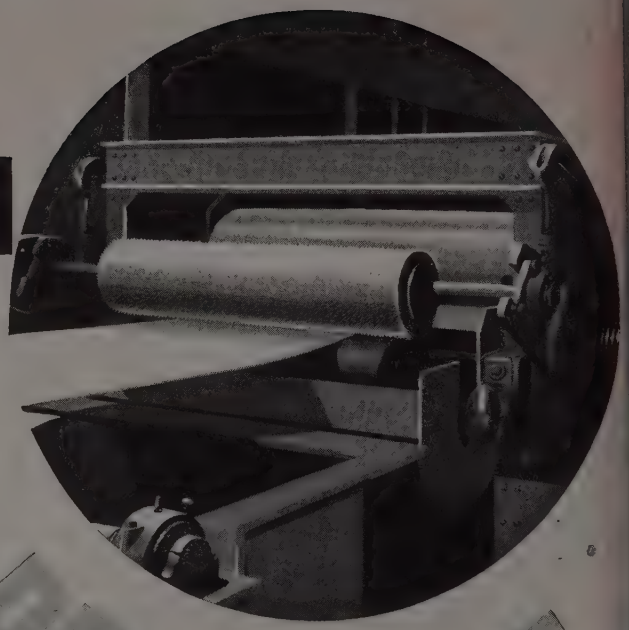


EASY INSTALLATION *and maintenance.* NATIONAL *Seamless Boiler Tubes combine strength and ductility in just the right proportions for easy workability and good performance.*

ON SHIPBOARD NATIONAL *Seamless Boiler Tubes offer utmost safety coupled with high steaming capacity and low fuel costs.*



How to give a cold rolled strip the BRUSH-OFF



● A characteristic problem of cold roll strip production is the removal of oil and other foreign matter. Pittsburgh has solved this by a 3-color, dense filled, medium stiff brush. This special brush of even trim, spiral wound, removes all rolling oil and other foreign matter after the strip has passed through a heated alkaline bath and been sprayed by clear water.

Such a brush has to take plenty of punishment for it is constantly subjected to both the softening effect of water and rapid friction of the strip. Brushes by Pittsburgh are skillfully and durably built to withstand this heavy going.

Why the Pittsburgh Plate Glass Company Makes Brushes

As a leading manufacturer of paints, Pittsburgh found that a reliable source of quality brushes was necessary for the proper application of its products. For over 40 years, Pittsburgh has made its own paint brushes. It was a natural step to extend its engineering and manufacturing facilities by developing production, maintenance and power-driven brushes engineered to the specific needs of industry.

It pays to use power-driven brushes by Pittsburgh

● You can depend on Brushes by Pittsburgh for top performance, enduring economy, and a minimum of lost time in changeovers. In the complete Pittsburgh line are brushes of all types, including "Perfect Balance" sections, wheels and section assemblies, Uni-Fill scratch brushes, as well as paint and other maintenance brushes. ● Consult the Pittsburgh engineering representative. He will gladly work with you in developing any type of power-driven brushes to meet your particular finishing requirements.

PITTSBURGH
PLATE GLASS COMPANY *Brush Division*
3221 FREDERICK AVENUE · BALTIMORE—29 · MARYLAND

ATON PERMANENT MOLD GRAY IRON CASTINGS

ntribute Quality to Modern Appliances-

Millions of Eaton Permanent Mold Gray Iron Castings are used annually in the domestic appliances industry for such critical parts as refrigeration valve plates, pistons, cylinder heads, pump bodies, sheaves, vee-belt pulleys, and many others.

In applications where liquids must be held under pressure, the dense non-porous structure of Eaton Permanent Mold Gray Iron Castings assures freedom from leakage. Ability to take a high surface finish and freedom from growth and distortion after machining recommend them for cylinder blocks, crankshafts, connecting rods, and gears. Free machinability makes for fast, uninterrupted production and a high percentage of perfect parts.

Eaton Foundry Division engineers will be glad to discuss the application of Eaton Permanent Mold Gray Iron Castings to your product.

Send for your copy of the illustrated booklet, *"A Quick Picture of the Eaton Permanent Mold Process for producing Gray Iron Castings."*

© 1947. EATON MFG. CO.

THE EATON PERMANENT MOLD MACHINE IS A SYMBOL OF THE QUALITY OF GRAY IRON CASTINGS PRODUCED BY THE PERMANENT MOLD PROCESS.

EATON
MANUFACTURING COMPANY
FOUNDRY DIVISION
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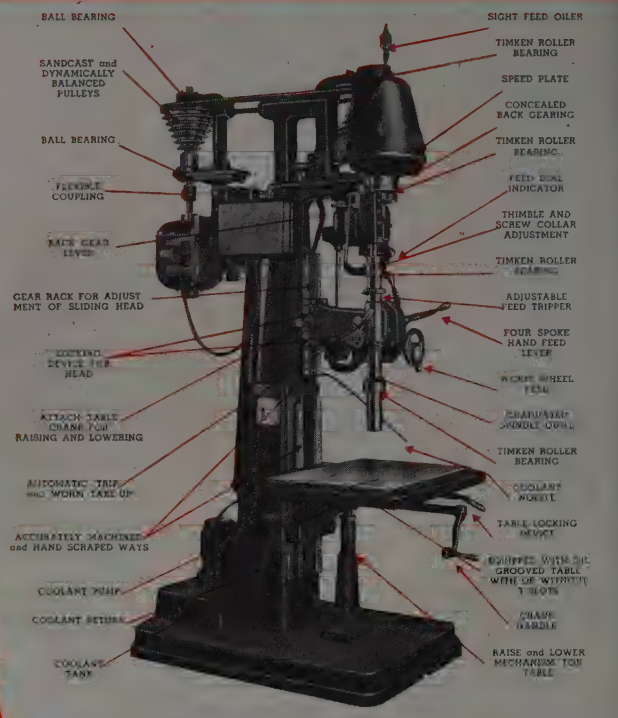
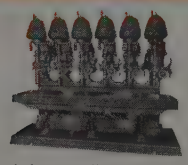
SLIDING HEAD BOX TYPE FLOOR DRILLS

Designed to provide an accurate, fast, sturdy, dependable drill for a moderate initial investment and low maintenance cost. Init is equipped with anti-friction ball bearings; all castings are seasoned and sturdy; all gears of high alloy steel, accurately machined; all surfaces are hand scraped to a minimum tolerance. Available with V-belt drive — 16 spindle speeds. Power feed of positive, gear driven type. Four rates of feed are obtained through dial knob indicator. Automatic stop for predetermined depth drilling. 21 size — 1½" capacity.



SINGLE SPINDLE MODEL

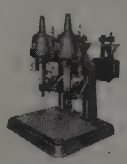
21" Box Column Sliding Head Floor Drill



6-Spindle 21" Box Column Sliding Head Floor Drill

4-Spindle 21" Box Column Sliding Head Floor Drill

16" No. 3000 F.V. 1-Spindle Box Column Floor Drill



16" No. 5—10,000 B.V 2-Spindle Bench Drill

14" No. 3000 F.V. 1-Spindle Sensitive Floor Drill

Standardize on CANEDY-OTTO drill presses throughout your shop. The completeness of the CANEDY-OTTO line enables you to do this — to fill all your requirements from this one source. So write today for our catalog describing in detail the many drill presses that bear the CANEDY-OTTO trade-mark — your guarantee of greater value, since 1892.

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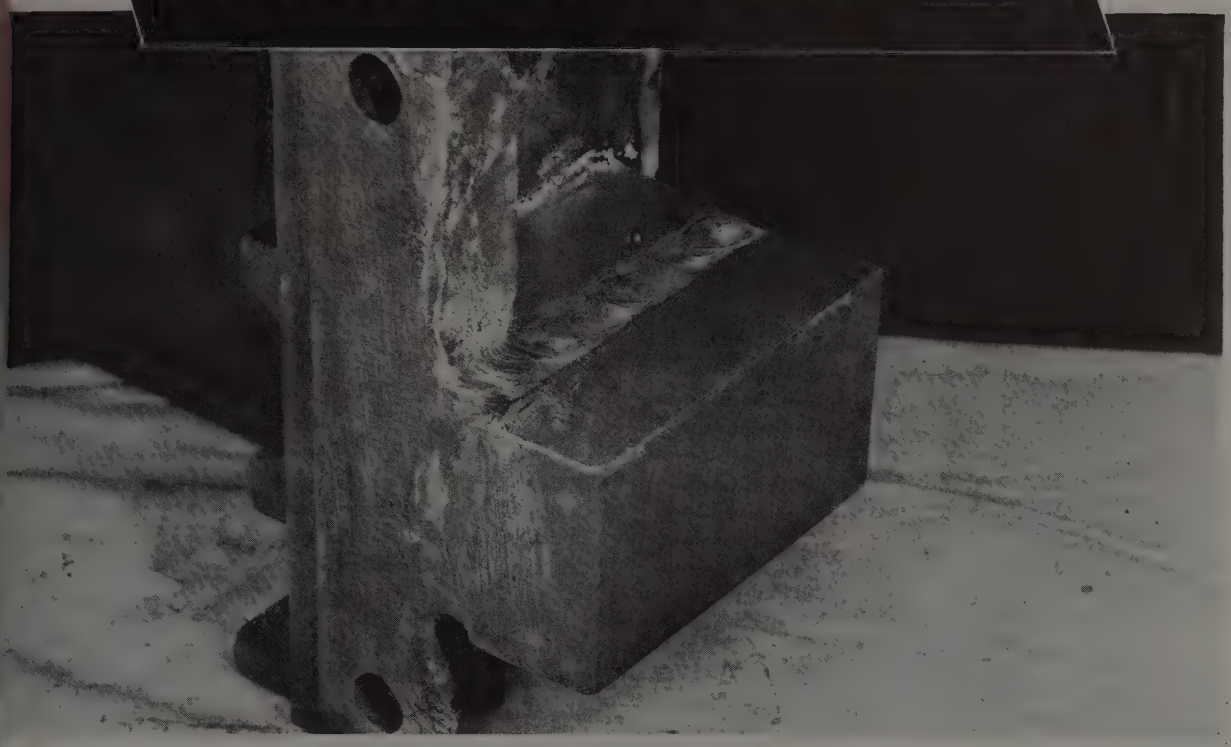

using Wilson # 200 Aluminum Bronze Electrode"

This 80 lb. cast iron trolley guide, after extreme wear, was restored by the Mack Welding Company of Duluth, Minnesota to original dimensions by arc welding — using Wilson No. 200 electrode.

First, each side of the guide was prepared by machining, then preheated to approximately 400° F with the oxyacetylene flame. Next a carbon steel block, 2½" x 3" x 6", was welded to each side. By keeping the welding current at the minimum, excessive penetration was avoided, and a strong bond was obtained.

With this technique, "Mack" found that no appreciable distortion resulted . . . machining was almost eliminated . . . and repair time was reduced approximately 50% over previous methods.

In general the Wilson No. 200 is used for joining aluminum bronze or other metals and combinations of dissimilar metals. Additional aluminum bronze electrodes in the Wilson line are Nos. 216, 220, 225 and 230. These are frequently used for their properties for nonferrous, hard overlay deposits. The deposits made with these electrodes are corrosion and acid-resistant and range in hardness from 70 to 300 Brinell. All are general purpose D.C. reverse polarity electrodes and are for flat position welding . . . with exception of No. 200 which can also be used in the horizontal position.

For further information on this group of Wilson aluminum bronze electrodes, or any other arc welding electrodes, we suggest you write to the nearest Wilson distributor; or if you prefer fill in and mail to us the coupon below.

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Please send me a copy of Wilson Electrode Catalog ADW 75 together with the latest electrode price list.

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*VEEDER READING is a standard term used by manufacturers to designate the performance figures which keep turning up on the faces of Veeder-Root Counting Devices built into—or installed on—any type of production machine or process.

These Veeder Readings are *direct* readings. Operators don't have to convert or translate them . . . which means far fewer errors. What's more, these readings indicate any mechanical slowdown, so that it can be corrected immediately . . . before final assembly bogs down, and inter-departmental timing is thrown off. These readings simplify the work of inspectors. And in many other special ways—according to the nature of the job—Veeder Readings help to save time and material, to keep costs down and output up.

That's why it pays to see to it that the new production machines you buy have this built-in Veeder-Root *Countrol*. And for the same reasons, it pays to build Veeder-Root Devices into your own machines or products. Like to see how? You can count on Veeder-Root engineers to help you, *now*. Write.

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Advertisement JUNE, 1947

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by Bridgeport Brass Co. "Bridgeport" BRASS CO. *Headquarters for BRASS, BRONZE and COPPER*

Are your metal specifications up to date?

Many Copper-Base Engineering Alloys Available

Engineering standards have risen and more dependable materials are needed to meet these higher requirements. Yet it is difficult for busy designers and engineers to keep in touch with metallurgical progress and gain a complete understanding of the properties of many special copper-base alloys which have come on the market.

Frequently orders are received for just "brass" or "bronze" without any reference to alloy, physical properties or application. Some manufacturers have taken steps to replace mediocre materials with the newest copper-base engineering alloys. However, in many cases manufacturers continue to use the same metal specifications over and over again and thereby miss an opportunity to improve their products through the use of strong corrosion-resisting alloys which can give greater dependability and longer service life.

During the past few years research and development have endowed brasses and bronzes with special properties which have extended their usefulness still further into fields where exceptional strength and corrosion resistance are required. Bridgeport has carried on a consistent program of metallurgical research and development, and has worked with many manufacturers on product improvement through the use of high-strength copper-base alloys for engineering applications.

Improved Copper-Base Alloys Used in Many Applications

This trend toward higher standards and the use of better materials extends into many fields. For example, the development of more electronic apparatus and the wider use of automatic equipment, operated by switches, relays and similar devices, make necessary refinements in spring materials which were unknown a few years ago.

Buyers of screw machine items are becoming more quality-conscious than ever before and it becomes necessary for manufacturers of screw machine products to turn out the highest quality product with the lowest investment in man-hours and materials.

Savings have been realized through the use of high-strength alloys suitable for the manufacture of cold upset and rolled threaded products. Scrap losses are reduced and man-hours conserved by this process. Many items can be made advantageously by hot forging and with higher tensile and yield strengths than are possible with castings.

Bridgeport Engineering Alloys

Presented here, in brief form, are some of Bridgeport's engineering alloys, together with physical properties, fabrication characteristics and other data. These alloys are designed for applications requiring materials which are stronger, tougher and more corrosion-resistant than brass or copper.

Phosphor Bronze (36) — High fatigue resistance, dependable spring action, toughness, and corrosion resistance. For switch springs, contact springs, relay arms, wipers and many other electrical and electronic applications. Fine for bellows, diaphragms, etc. Supplied as strip.

(*Continued on page 2, column 2*)

COPPER-BASE ENGINEERING ALLOYS

NOMINAL ANALYSIS		Phosphor Bronze Gr. A (36)	Alum. Bronze (712)	Alum. Bronze (715)	Duronze II (632)	Cadmium Copper (980)	Duronze III (707)	Duronze V (609)	Phono Bronze (840)	Hardware Bronze (89)
Copper %		94.35	95.5	96.9	97.0	99.0	91.0	98.0	98.6	89.0
Lead %										2.0
Tin %		5.5							1.4	
Zinc %										8.5
Silicon %			1.0	.35	3.0		2.0	2.0		
Phosphorous %		0.15								
Aluminum %			3.5	2.75			7.0			
Cadmium %						1.0				
Ten. Strength psi	Hard	81,000	97,000	75,000	94,000	55,000		80,000	65,000	52,000
	Soft	50,000	65,000	40,000	60,000	35,000	90,000	45,000		37,000
Yld. Strength psi (@ ½% extens. under load)	Hard	75,000	63,000	55,000	58,000	45,000		55,000	50,000	45,000
	Soft	21,000	30,000	16,000	25,000	15,000	50,000	20,000		12,000
Elongation % in 2"	Hard	10	5	15	8	6		12	8	18
	Soft	52	50	55	60	60	27	50		45
Rockwell Hardness	Hard	B87	B93	B85	B93	B65		B75	B75	B58
	Soft	F77	B65	F65	F85	F35	B85	F70		F55
Melting Pt. (Liq.) °F.		1920	1890	1920	1895	1975	1814	1940	1970	1900
Coeff. Therm. Exp. per °F. from 77°F. to 572°F. x 10^{-6}		9.9	9.3	9.4	9.3	9.4	9.2	9.9	8.89	10.2
Density, lbs./cu. in.		.320	.301	.308	.309	.321	.278	.316	.321	.319
Thermal Conduct. Btu/sq. ft./ft/hr/°F. @ 68°F.		47	33	40	21	180	22	27	120	104
Elec. Cond. % IACS @ 68°F. Soft		18	12	15	7	80	7	9	48	42
Mod. of Elas. (Tension) psi		16,000,000	16,000,000	15,000,000	15,000,000	16,000,000	16,500,000	17,000,000	17,000,000	17,000,000
Machinability Rating		20	40	30	30	20	60-70	30	20	80
Cold Working Rating		E	E	E	E	E	P	E	E	G
Hot Working Rating		P	F	G	E	E	E	E	G	P
Hot Working Range °F.			1400-1600	1350-1600	1300-1600	1250-1450	1300-1600	1300-1600	1450-1600	

All figures are average values and should not be used for specifications. E=Excellent F=Fair G=Good P=Poor
See text for forms in which these alloys are supplied.

COPPER ALLOY BULLETIN

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, research chemist of the Bridgeport Brass Company.

GALVANIC CORROSION

Types of Galvanic Cells Encountered in Service

In previous issues we have discussed galvanic corrosion cells where the metals are immersed in solutions of their own ions. Under actual service conditions, we are generally concerned with the behavior of galvanic couples exposed to solutions virtually free of their own ions. In addition, under conditions of actual use, it is difficult to define the conditions (concentration of ions, films on metal surfaces, etc.) with sufficient accuracy to theoretically calculate the potential of the galvanic cell. For this reason, it is most convenient and satisfactory to conduct actual tests.

Value of Galvanic Corrosion Testing

Galvanic corrosion tests conducted in the laboratory, field or plant yield much useful information pertaining to:

(1) Direction of current flow.
(2) Magnitude of current flow (amperage).
(3) Distribution of corrosion.
(4) The EMF (voltage) between various pieces of metal equipment.
(5) Metal combinations which will result in serious galvanic corrosion (large potential difference).
(6) Metal combinations where the stimulation of corrosion will be insignificant (small potential difference).
(7) Effect of area size.
(8) Usefulness of various protective measures.
(9) Effect of variations in solution composition.
(10) Effect of pH.
(11) Effect of aeration.
(12) Effect of surface condition of the metals.
(13) Effect of agitation.
(14) Effect of metal composition (alloy).
(15) Effect of films formed prior to immersion.
(16) Effect of variations occurring over a period of time (Time-Potential Curves).

Galvanic Series Varies With Corrosive Environment

Information obtained on a group of metals, examined under a *given set of conditions*, makes it possible to arrange the metals in a galvanic series. It is of particular interest and value to note that the order of the metals in such a galvanic series *does not* always follow the same pattern. That is, the order is not the same as that shown by their standard electrode potentials which appear in so many handbooks and textbooks under the title of "Standard Electrode Potentials" or "Electromotive Series." The order frequently changes very markedly with the corrosive environment. This will be covered in greater detail in subsequent discussions.

Are your metal specifications up to date?

(*Continued from page 1*)

Aluminum Bronze (712) — Similar to phosphor bronze spring metal in physical properties and applications. Does not contain tin. Supplied as strip and tubing.

Aluminum Bronze (715) — High strength and corrosion resistance combined with sufficient ductility for cold forming. As wire it is used for stranded cable wire and cold headed bolts. As strip, it is used for cold formed electrical connector parts. Supplied as rod, wire, and strip.

Duronze II (632)—For spring applications which are not too severe. Annealed material also used for small welded tanks. Supplied as rod, wire, strip, and tubing.

Cadmium Copper (980)—For electrical applications requiring a material with high electrical conductivity. Stronger and more wear resisting than copper. Supplied as rod, wire, and strip.

Duronze III (707) — Silicon aluminum bronze. For high strength hot forgings and screw machine products. Exceptional corrosion resistance and wearability. For valve stems, guides, bushings, pump parts, nuts, bolts, gears, pinions, rubbing and sliding parts. Supplied as rod.

Duronze V (609)—Wire has remarkable malleability even when hard drawn. Ideal for cold forged parts such as cap and machine screws, nuts, bolts, pole line hardware, electrical connectors, small gears, etc. Supplied as rod, wire, strip, and tubing.

Phono Bronze (840) — Very malleable and stronger than copper. Has good electrical conductivity, fine corrosion resistance and wearability. As wire it is used for pole line hardware, outdoor electrical connectors, etc. As strip, it is used for clutch plates and current-carrying electrical parts. Supplied as rod, wire, and strip.

Hardware Bronze (89) — Free machining, good corrosion resistance, moderate in strength. For making nuts, wire and cable connector parts, hardware fittings to match cast bronze in color. Supplied as rod.

More complete information about the range of copper-base alloys, composition, physical and mechanical properties, applications and specifications will be found in Bridgeport's 128-page Technical Handbook. Write for your copy and contact the nearest Bridgeport office for assistance in product improvement through the use of copper-base engineering alloys.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

New V-Block pneumatic head is said to check two diameters on pinion shafts, with scales reading to .0005" on both sides of zero. Head is available with one or more gaging points for a range of work diameters from .150" to 8". Rotating work is claimed to check roundness, and sliding to check taper. **No. 767**

Quick-Acting Vise is reported to be especially useful for work on precision electrical parts. Quick action is accomplished by pushing barrel and screw assembly until jaws contact work. Partial turn of screw then holds work. Maximum jaw opening is 1⅛". Jaws are fitted with removable inserts which can be replaced by soft metal or plastic. **No. 768**

Roll Type Feeder is said to speed punch press operation on strip stock. It takes strip from a coil, and is reported to handle thickness to 3/16", width to 6" and maximum feed stroke to 6" on presses having 3" stroke or greater. On any installation it is said the feed length can be adjusted in increments as small as .001". **No. 769**

New Insulating Tubing made of glass fibers is claimed to be immune to fraying at the ends or burning on application of heat. It can be applied over a wire and the wire then bent sharp to 90° without the insulation cracking or splitting. In two dielectric strengths—5,000 to 7,000 volts or 2,000 to 4,000 volts. **No. 770**

Electronic Induction Heating equipment is announced for use in soldering or brazing small and medium work pieces. The applicator takes coils of various shapes for given work, and is claimed to be adaptable for hand operation or automatic continuous production of brazed or soldered connections. **No. 771**

New Hydraulic Power Unit is said to drive, feed and retract cutting tools for operations such as drilling, reaming, boring, spotfacing and milling. It is claimed to provide rapid approach, two independent variable feed rates and retraction for the spindle of 4⅛". Applies horizontally, downward-facing vertically or at any angle between these positions. **No. 772**

Tension Gage is said to enable users to increase hack saw service life as much as 15% by assuring correct tension setting. Gage mounts on the blade and is clamped in place prior to application of tension. Pointer indicates when correct tension has been reached. **No. 773**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

Warehouse Service in Principal Cities

STRIP AND SHEET—For drawing, stamping, forming, spinning. Leaded alloys for machining, drilling, tapping. Silicon bronze, phosphor bronze for corrosion resistance. Alloys suitable for springs. Engravers' copper and brass.

WIRE — Cold Heading alloys for screws, bolts, nuts, nails, fastenings, electrical connectors, Phono-Electric trolley and contact wires.

ROD — Alloys for screw machine operation. Duronze III high strength, corrosion-resistant, good for machining and hot forging. Hot forging and cold heading alloys. Welding Rods. Copper-covered ground rod.

TUBING—For miscellaneous fabrication. For condensers and heat exchangers. For water, air, oil and hydraulic lines.

DUPLEX TUBING—for conditions too severe for a single metal or alloy.

PIPE—Brass and copper for plumbing.

FABRICATED GOODS — Plumbing brass goods. Radiator air valves. Aer-a-sol insecticide dispensers. Automobile tire valves.

TECHNICAL SERVICE—Staff of experienced, laboratory-trained men available to help customers with their metal problems.

WAREHOUSE SERVICE—Warehouse and jobbers stocks available for prompt delivery in principal cities.

TECHNICAL LITERATURE—Manuals and handbooks available for most products.

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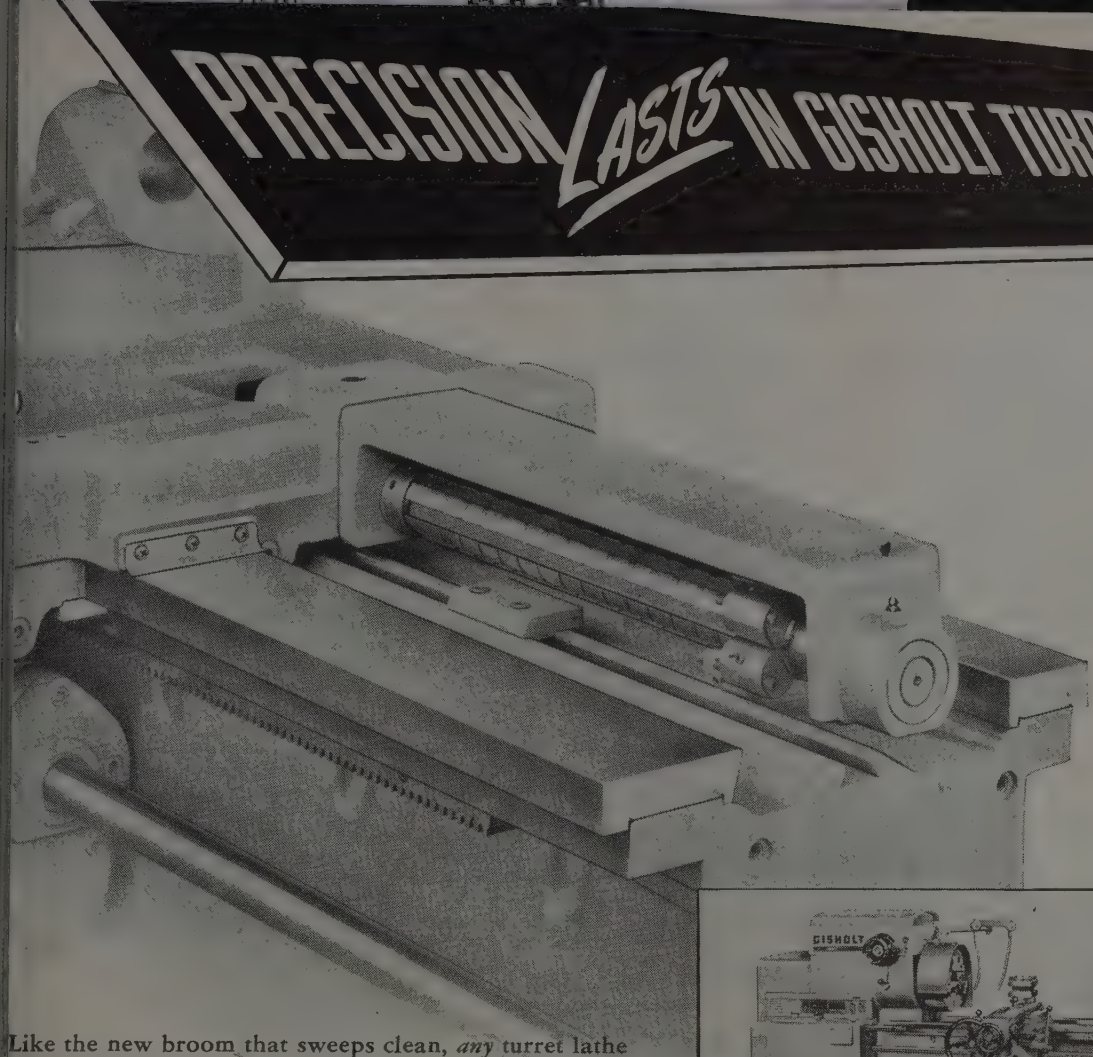
PRECISION *LASTS* IN GISHOLT TURRET LATHES



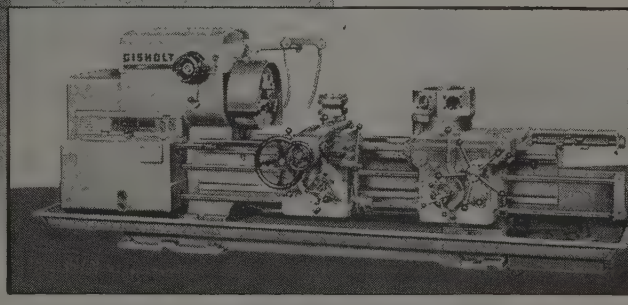
Like the new broom that sweeps clean, *any* turret lathe may be accurate for a time—when it is new. But sustained accuracy through the years? Close tolerance work when the lathe is five, ten, or more years old?

Gisholt precision is planned, "built-in," and consequently far more permanent than that of many other lathes which are merely *fast starters.*

For example: Gisholt's bed ways are of hardened tool steel (64-66 Rockwell C)—virtually wearproof. Accuracy is *dependable* because the ways are keyed and firmly bolted to the bed and then finish ground in exact alignment with the spindle.

Further, the headstock and bed, cast in one piece, are heavy and rigid—not subject to distortion. The forged steel spindle, mounted in precision tapered roller bearings at both ends, carries heavy work at maximum speeds and feeds without deflection or chatter—year after year.

These, and many other provisions for *permanent* accuracy, are the assurance of lasting precision in the performance of Gisholt turret lathes. If you have one, YOU KNOW!



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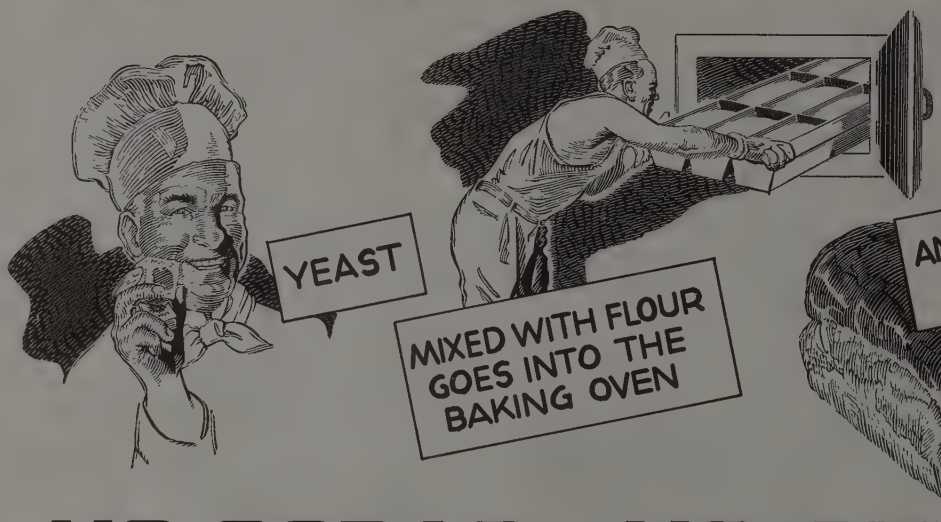
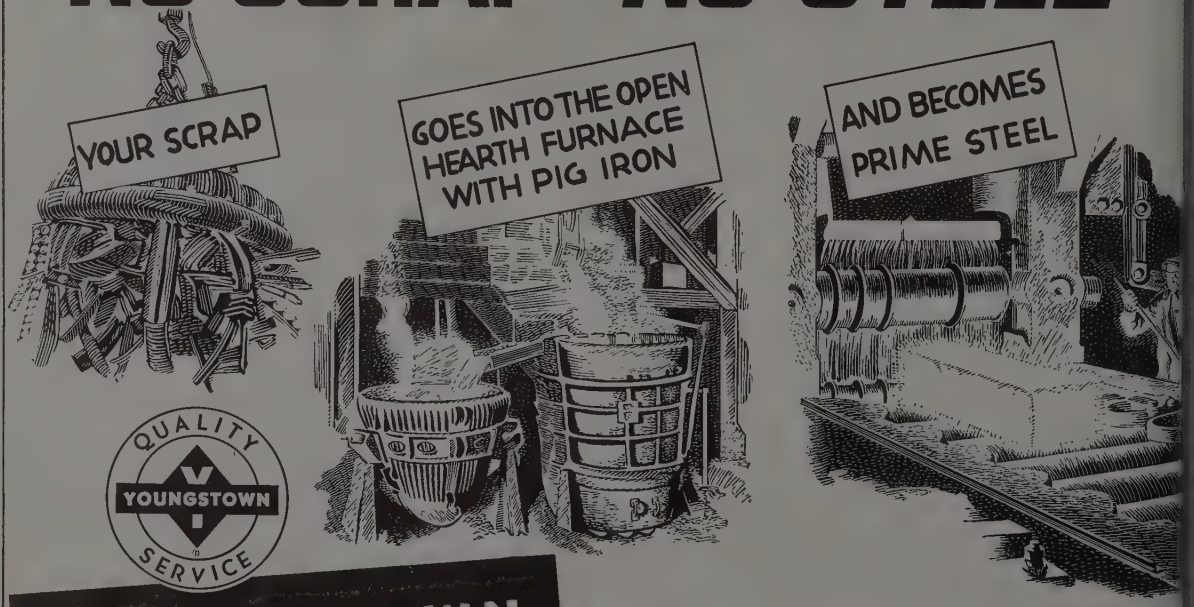


NO SCRAP - *NO STEEL*



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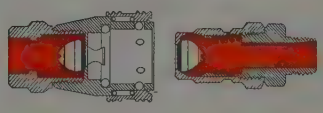
Write for Industrial Catalog

The Hansen Two-Way Shut-Off Coupling.



Red section shows how rubber washer in valve stem contacts valve seat in both plug and socket, sealing both plug and socket against leakage instantly.

Red section shows flow of liquid or gas around spool section of valve, permitting free flow of liquid or gas through coupling instantly upon connection.

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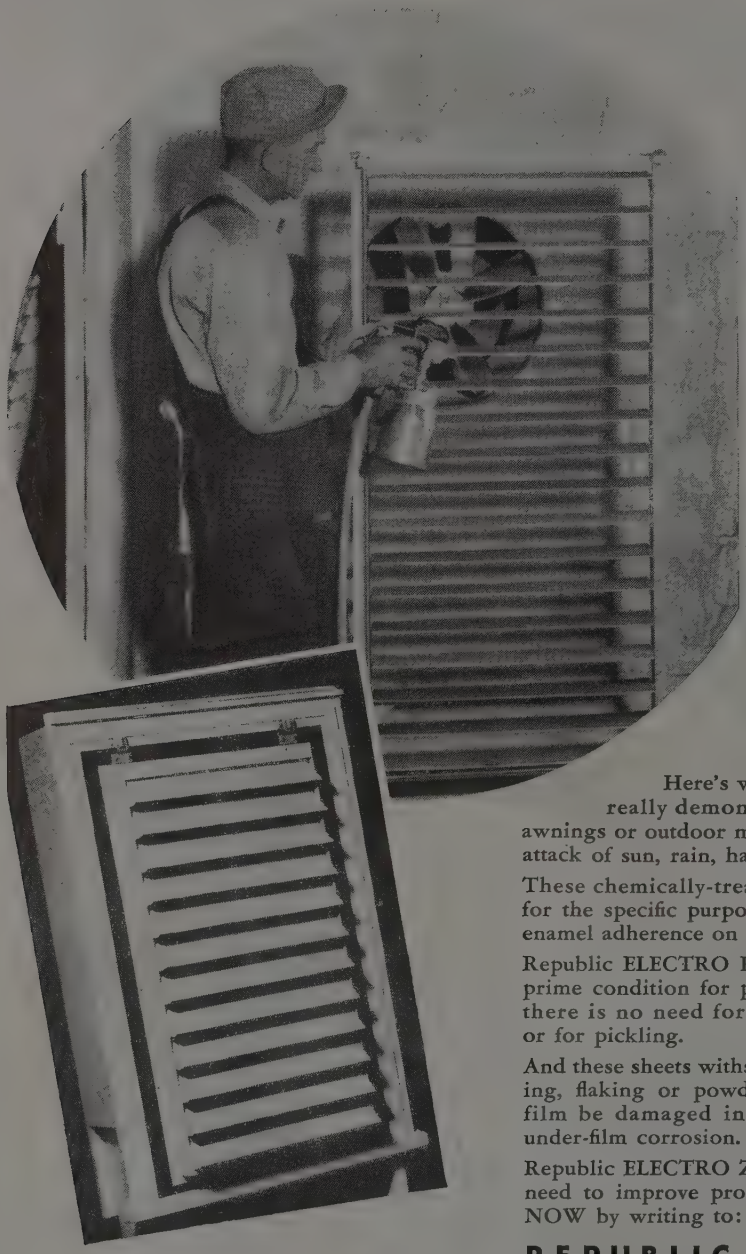

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Republic Electro Zinc Plated Products include ELECTRO PAINTLOK and ELECTRO ZINCBOND in sheets and coiled strip, in various widths depending on gauge involved.

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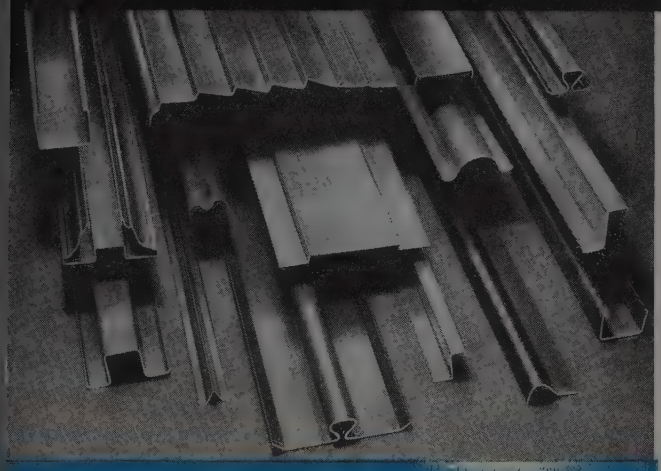
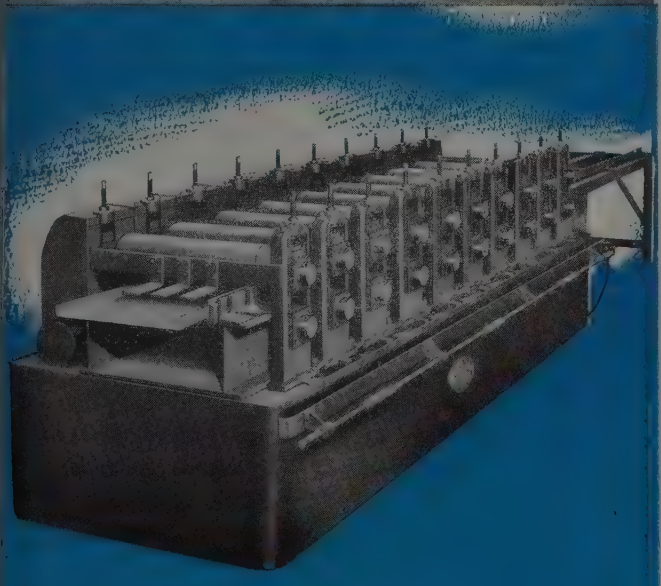
Seven Big Advantages of COLD-ROLL-FORMED Shapes

STRUCTURALS • PANELS • TUBING • MOULDINGS • TRIM





SERIES OF SEVEN

No. 3

Fine Surface Finish

Sheets and strip, for cold-roll-forming purposes, is readily obtainable, pickled or cold rolled, affording a fine, smooth surface, free from rust, scale, roughness and sharp corners, and therefore admirably adapted for modern fabricating purposes.

This and six other factors, equally important, (all explained in Yoder Bulletin No. 101), make it clear why cold-roll-formed structural shapes are finding ever widening uses in American industry. Ships, railroad coaches, airplanes, automobiles, trucks, furniture and fixtures, steel buildings, refrigerators—these are just a few out of hundreds of uses.

In many cases, where slitting, coiling, embossing, curving, welding and other operations are also necessary, they may be done on standard Yoder-built accessory equipment, installed with a Yoder Forming Mill, at a great saving in unit cost.

If you suspect that somewhere in your plants a Yoder production line might take the place of older and slower methods, the services of Yoder engineers are at your disposal in finding the right answer. Remember, you incur no obligation by consulting us.

Yoder Bulletin No. 101 contains illustrations, facts, and figures on cold-roll-formed products and the machines for making them.

THE YODER COMPANY

5502 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER TRADE MARK MANUFACTURING

ROLL FORMING AND TUBE MILL MACHINERY

36 YEARS' LEADERSHIP • COILING • SLITTING • FORMING • EMBOSSING • CURVING • WELDING • CUTTING-OFF

to speed production, and cut your costs

● For annealing or normalizing, brazing, hardening, carburizing, nitriding or any other heat treating process, select an EF furnace,—they are built in many different designs, and in sizes to meet any requirement. Each installation is engineered and built specially for the particular and individual need,—thus assuring the smooth, continuous flow of material through the heat treating process, fully up to the desired capacity and physical specification.

EF furnaces will give you the utmost in efficiency and economy, and reflect the advantage of many service-proved features—conceived and perfected by EF engineers—and available only in EF design. These advantages include the EF radiant tube and EF heat exchanger, which combine to assure extremely high combustion efficiency; EF heavy, cast alloy electric heating elements, EF roller design and mounting, EF special atmosphere generators and many other devices that assure uniform temperature throughout the furnace, accurate control of heat within the required limits, low maintenance, high hourly outputs, and uniform, low cost, dependable operation.

Let EF engineers with their long and outstandingly successful experience work with you on your next heat treating job!

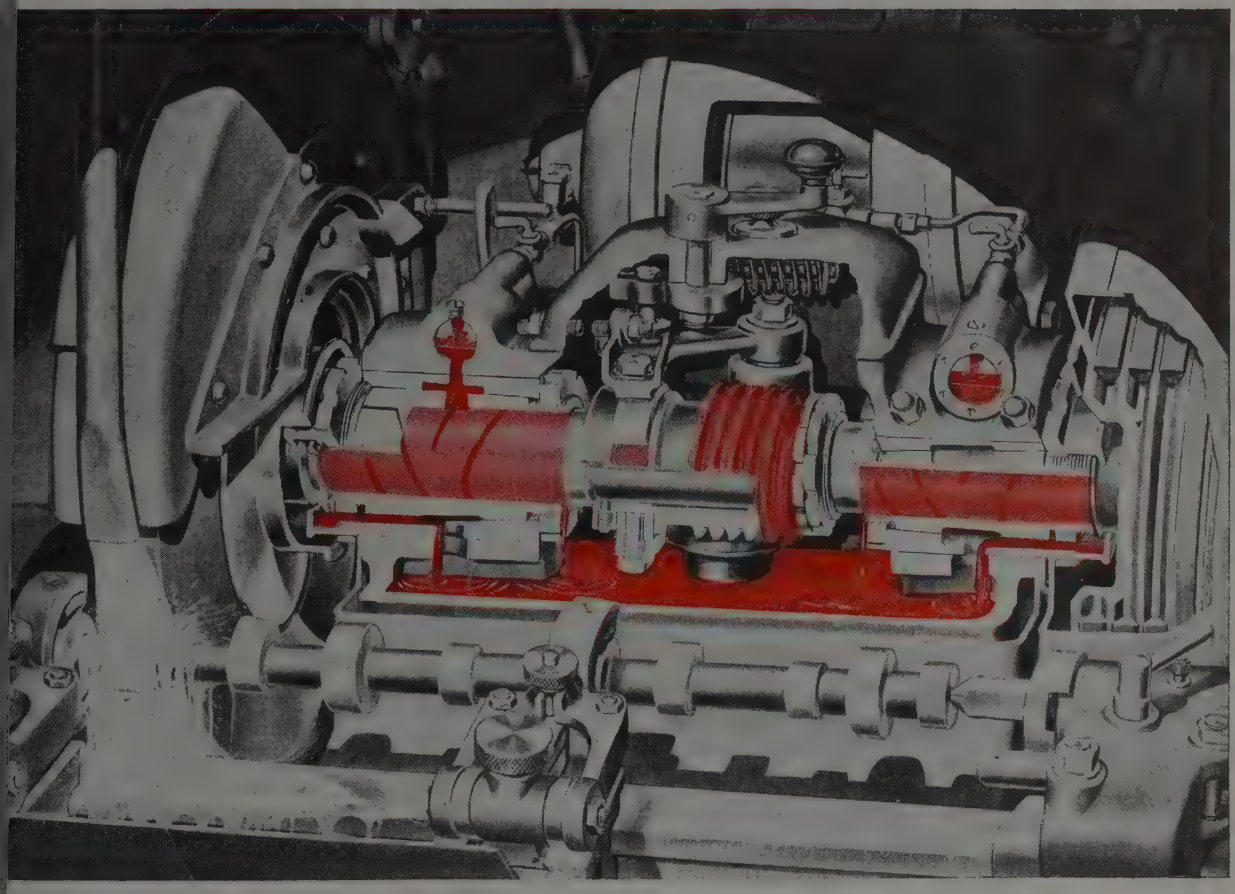
EF THE ELECTRIC FURNACE CO.
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION
Salem-Ohio

Close Play for Oil Here!

Inside Knowledge on Lubrication Problems

— CLOSE CLEARANCES —

This is One of a Series of Messages on Common Problems in Your Plant



THIS MODERN precision grinder gives lubricating oil a close play. In fact, the clearances between that spindle and bearing are so close that they might be called "zero clearances." At the same time, the spindle is speeding at 800 to 1,200 R.P.M.

Combined, these conditions cause severe friction within the oil itself. The resulting heat speeds oxidation, can cause rapid deterioration of the oil.

To prevent this, you need an oil with exceptionally high chemical stability, an oil that will resist oxidation under internal friction and heat. Also, this oil must provide strong, persistent films to protect the spindle and bearings during the critical warm-up period.

Gargoyle Velocite Oil E penetrates quickly into the small clearances, minimizes internal friction and heat and provides maximum protection for all working parts at all times. Approved by machine builders and proved in thousands of machines during the past few years, this superior product helps maintain continuous, accurate production.

Get this proved lubricant when you have a close play inside your machines.

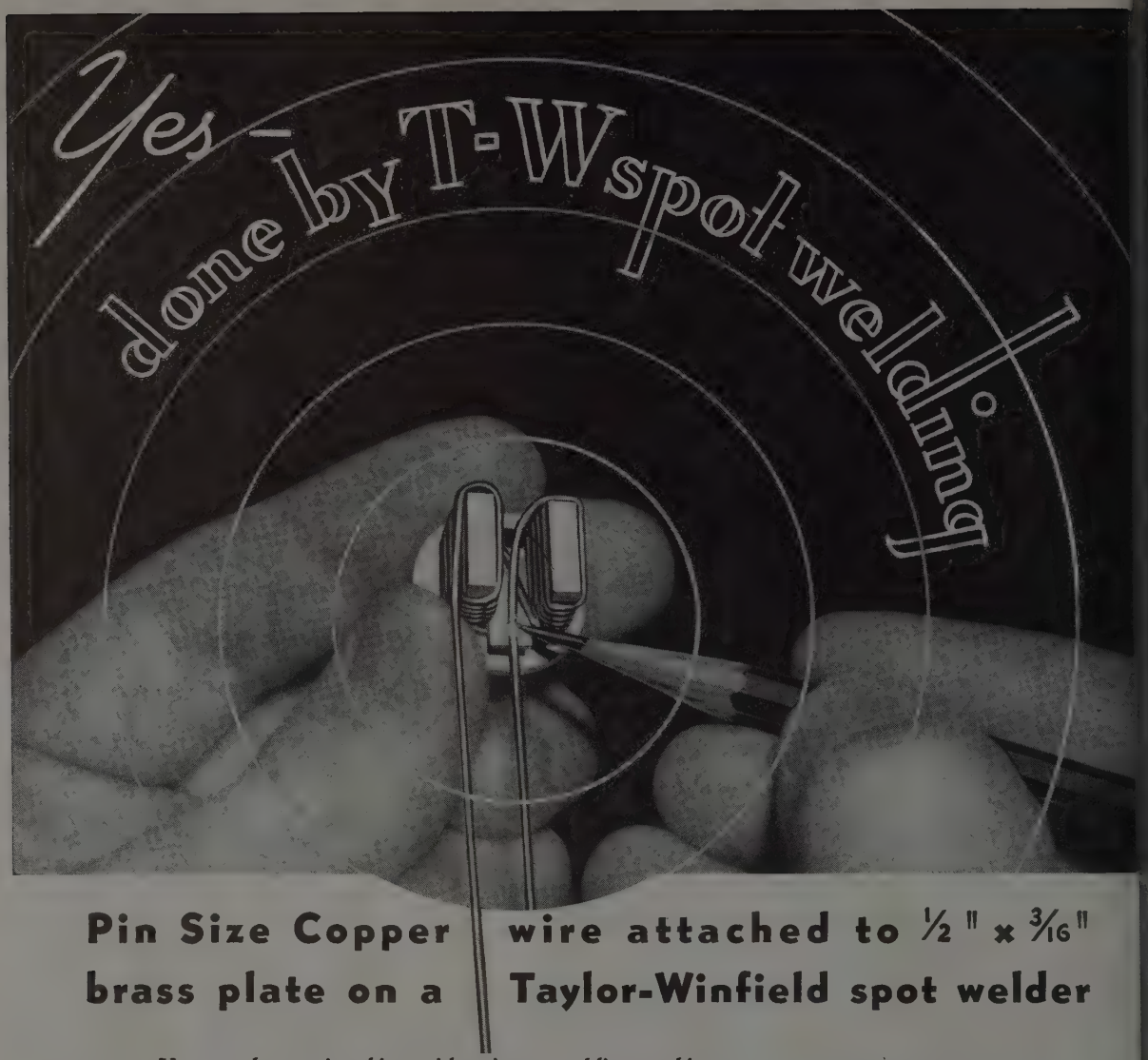
GARGOYLE Lubricants

SOCONY-VACUUM

SOCONY-VACUUM OIL CO., INC.
and Affiliates: Magnolia Petroleum Co.
General Petroleum Corporation

Socony-Vacuum Correct Lubrication

FOR EVERY MACHINE . . . EVERY OPERATING CONDITION



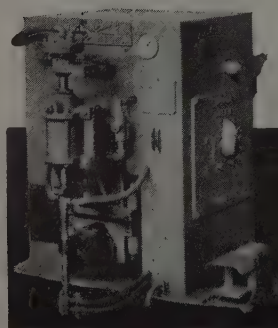
Pin Size Copper brass plate on a wire attached to ½" x 3/16" Taylor-Winfield spot welder

You can do amazing things with resistance welding machines.

The usual method for attaching this wire to the minute brass plate would be soldering. But too many fumbling thumbs cause too many rejects. Equally important, corrosion troubles are eliminated because resistance welding does not require the use of flux.

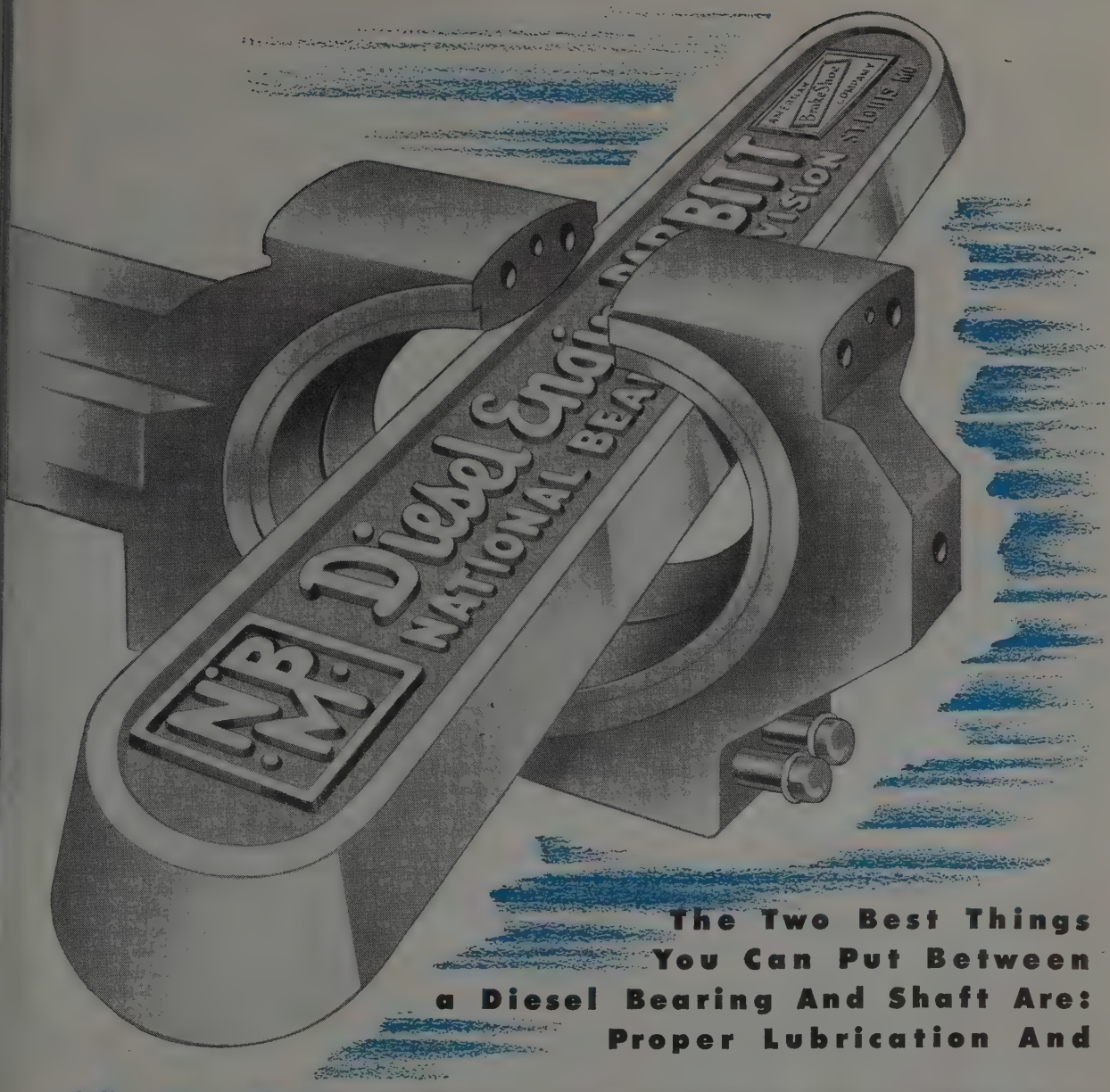
Taylor-Winfield equipped a Spot Welder with special dies to expedite handling of the odd-shaped parts. Result, continuous production with practically no rejects on this electrical part.

Resistance welding has put the joining of metals on a production basis. Try it and watch those production costs go down. *Write Taylor-Winfield for profitable information on spot, seam, flash-butt, or projection, all forms of resistance welding.*



Combining streamlined appearance with sound engineering practice, Taylor-Winfield spot welders are used for the welding of clean and coated carbon steels, stainless steels and weldable alloys of aluminum, nickel, copper and magnesium.

The TAYLOR-WINFIELD CORPORATION
WARREN · OHIO



The Two Best Things You Can Put Between a Diesel Bearing And Shaft Are: Proper Lubrication And

N-B-M DIESEL ENGINE BABBITT

- Bonds easily—resists squeezing out
- Excellent embedability and hardness retention
- Great compressive strength and safety factor are your surest protection against seizure, fatigue and overstress.

N·B·M

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION
ST. LOUIS • NEW YORK

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

SELF-LOCKING *Protects Inaccessible Parts* **AGAINST LOOSENING AND BREAKING**

The Red Elastic Collar protects prestressed or positioned settings against VIBRATION!

Washington Iron Works engineers state, "We have found that the use of ESNA Elastic Stop Nuts on our Diesel connecting rod bearing bolts entirely eliminates the necessity of loosening or tightening the nut in order to use the cotter key lock—thereby eliminating uneven stresses in setting up the bearing bolts. We have also applied them to the cam shaft bearing bolts, the fuel pump rack assembly, and on the carefully adjusted fuel cams. The use of Elastic Stop Nuts has proved very satisfactory in all respects."

Drilled bolts are unnecessary with ESNA Elastic Stop Nuts. These nuts can be tightened to develop exactly predetermined bolt loadings. They automatically lock in position without troublesome adjustments.

In addition, they protect against Vibration, Thread Corrosion, Thread Failure and Liquid Seepage. This multiple protection helps achieve the double economy of inventory simplification and reduced procurement costs. ESNA Engineers are ready to study your fastener problems. Industrial distributors are stocked and ready to give prompt service. Address: Elastic Stop Nut Corporation of America, Union, New Jersey. Sales Engineers and Distributors are conveniently located in principal cities.

LOOK FOR THE RED COLLAR
THE SYMBOL OF SECURITY

It is threadless and dependably elastic. Every bolt—*regardless of commercial tolerances*—impresses (does not cut) its full thread contact in the Red Elastic Collar to fully grip the bolt threads. In addition, this threading action properly seats the metal threads—and eliminates all axial play between the bolt and nut.

All ESNA Elastic Stop Nuts—*regardless of size or type*—lock in position anywhere on a bolt or stud. Vibration, impact or stress reversal cannot disturb prestressed or positioned settings.

ESNA
TRADE MARK

ELASTIC STOP NUTS

PRODUCTS OF: ELASTIC STOP NUT CORPORATION OF AMERICA

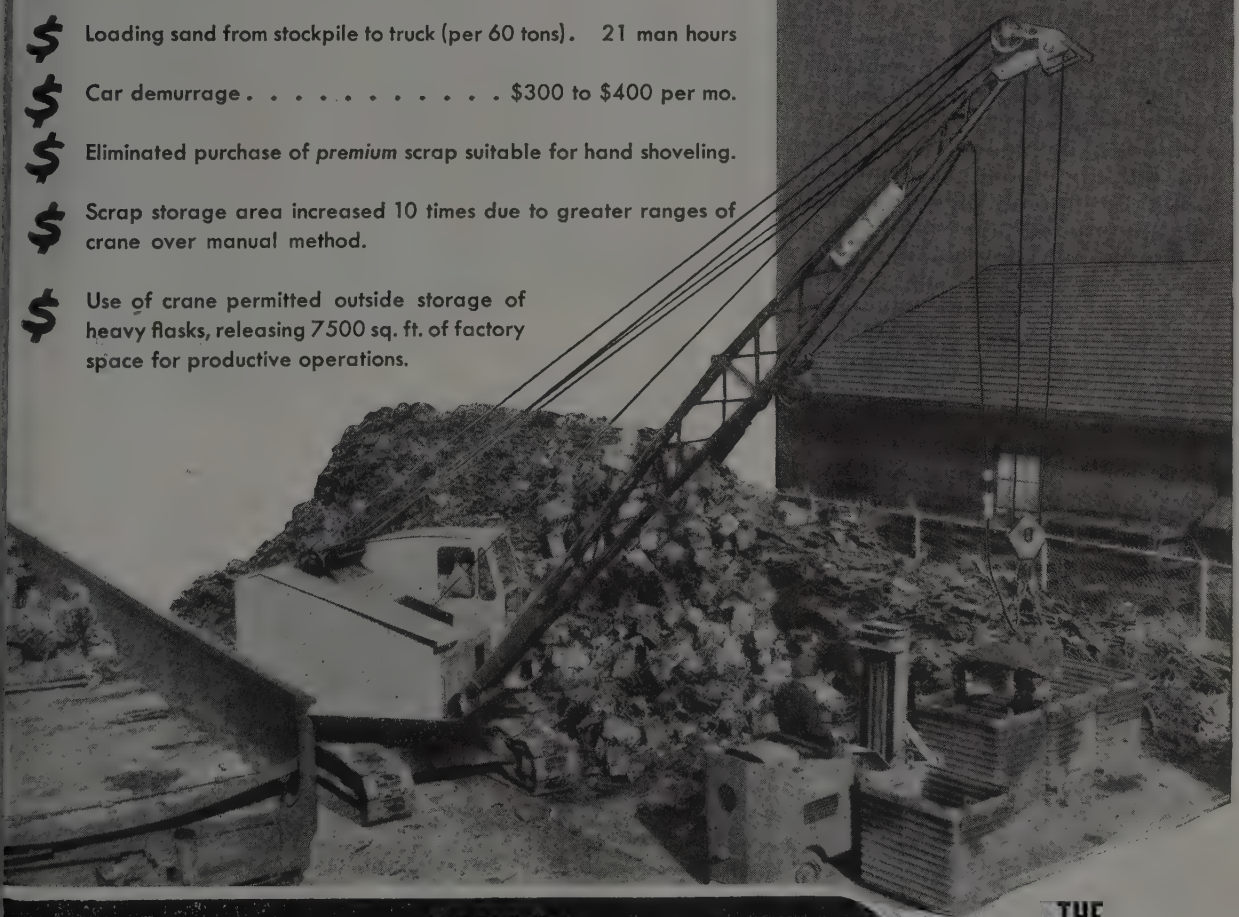
LORAIN CUTS COSTS

8 ways...

A well-known Northern Ohio foundry recently installed its first crane — a Lorain TL-20. The results were quick, startling and positive. Check these savings of crane-handling materials over man-handling methods—then look out the window at your yard and see what you can save.

Labor saving, cost-cutting Lorain cranes are available as 2-speed crawler units or with rubber tire mountings (self propelled or two-engine types). Your local Thew-Lorain distributor can supply complete information. Call him today.

	OPERATION	SAVINGS
$	Unloading scrap from cars to stockpile (per car) .	36 man hours
$	Loading scrap from stockpile to charging boxes (per day)	13 man hours
$	Unloading sand from cars to stockpile (per car) .	28 man hours
$	Loading sand from stockpile to truck (per 60 tons) .	21 man hours
$	Car demurrage	$300 to $400 per mo.
$	Eliminated purchase of *premium* scrap suitable for hand shoveling.	
$	Scrap storage area increased 10 times due to greater ranges of crane over manual method.	
$	Use of crane permitted outside storage of heavy flasks, releasing 7500 sq. ft. of factory space for productive operations.	



Reg. Trade Mark

thew-Lorain

THE THEW SHOVEL COMPANY
LORAIN, OHIO

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

SAVE TIME, MONEY and TOOLS

Use BONDERIZING as an aid in drawing

EIGHT IMPORTANT ADVANTAGES

Here are the advantages Bonderizing brings to drawing operations: (1) Permits use of a wider range of lubricants; (2) allows wider variation in steel composition; (3) Reduces metal to metal contact; (4) prolongs tool life; (5) permits faster drawing speeds and deeper draws; (6) reduces necessary process anneals; (7) reduces material breakage; (8) gives smoother finish to product.

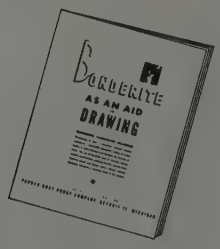
The nonmetallic crystalline Bonderite* coating stretches and crushes in the drawing operation, but remains a cushion between work and tools. Bonderite's great affinity for oil holds lubricant. Result, faster drawing, fewer rejects, longer life for expensive tools and dies.

Investigate Bonderizing as an aid in drawing!

PARKER RUST PROOF COMPANY • **2158 East Milwaukee Ave., Detroit 11, Mich.**

*Bonderite—Reg. U. S. Pat. Off.

SEND FOR YOUR COPY OF THIS *Valuable* BOOK



Parker technical bulletin "Bonderite As An Aid In Drawing" may help you save time, money and tools. Write today for your copy. It's FREE, of course.

BONDERIZING — Halts Paint to Metal
PARKERIZING — Inhibits Rust
PARCO LUBRIZING — Retards Wear on Friction Surfaces

PARKER PRODUCTS CONQUER RUST

Sheave to Transmit 1400 Horsepower . . .

. . . or a Belt for a 1/4 hp Compressor!

CALL ON THE TEXROPE LINE for the *best* in V-belt engineering and V-belt equipment. That has been true for 22 years — ever since Allis-Chalmers originated the Multiple V-belt drive for industry.

Back of every *Texrope* installation — from fractional horse power V-belts that manufacturers put on washers, air-compressors or water systems—to the biggest V-belt drives ever designed and successfully applied—stands the finest V-belt engineering talent in the world.

There's no substitute for this vast experience and tremendous fund of knowledge. It is reflected in every *Texrope* product.

What do *you* need . . . a few V-belts and sheaves — or a daring new application of the multiple V-belt principle? Call on the *Texrope* line! Equipment and engineering help are as close as your nearest A-C sales office or dealer. ALLIS-CHALMERS, MILWAUKEE.

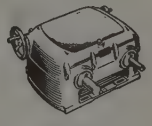
A 2187

TEXROPE .. Greatest Name in V-Belt Drives

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.



SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947
A CENTURY OF SERVICE to Industry THAT MADE America Great

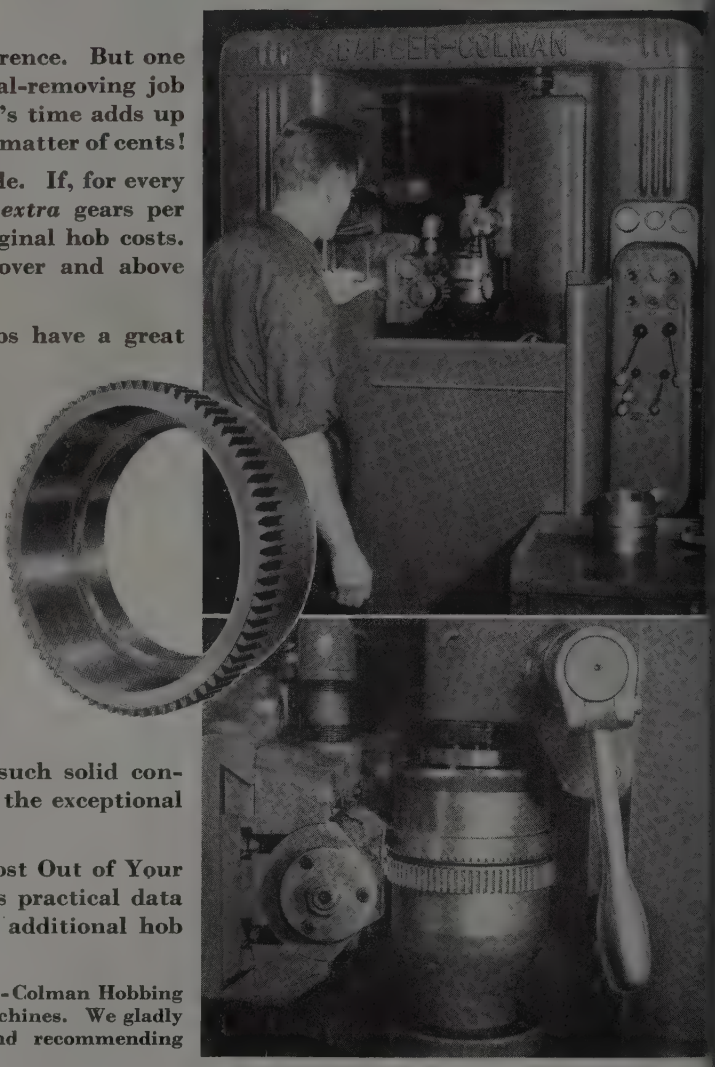
A DOLLAR.... OR NINETY NINE CENTS?

Which Are You Paying in Hob Costs?

Sure! It only amounts to a penny difference. But one cent on every operation — on each metal-removing job in your production line — in one month's time adds up to a substantial amount. Cost really *is* a matter of cents!

Take your hobbing operations for example. If, for every hob used you obtain one, two, or ten *extra* gears per hob sharpening, you save money on original hob costs. It amounts to that many *free* gears over and above normal hob life.

And the machines used with these hobs have a great deal to do with the extra productivity gained beyond the quality of the hob, and care used in shifting, sharpening and cutting



Barber-Colman Hobs have a reputation for toughness, long life, and *extra* cutting mileage. The B-C Type V Hobbing Machine provides assurance for this "plus" performance. Behind each hob cutting on the "V" Machine, stands the "backing" necessary for vibrationless support, steady power pull, and smoothness of cut. Automatic cycling and hydraulic movements positively duplicate each motion at the exact time. With such solid controls there is no cause to wonder about the exceptional hob life obtained on this machine.

SEND for a copy of How To Get The Most Out of Your Hobs Through Proper Sharpening. This practical data will offer suggestions on how to obtain additional hob life and tool economy.

WAR ASSETS MACHINES — Consult Barber-Colman Hobbing Service for age and capacity on surplus B-C Machines. We gladly offer assistance in estimating production and recommending proper tooling.

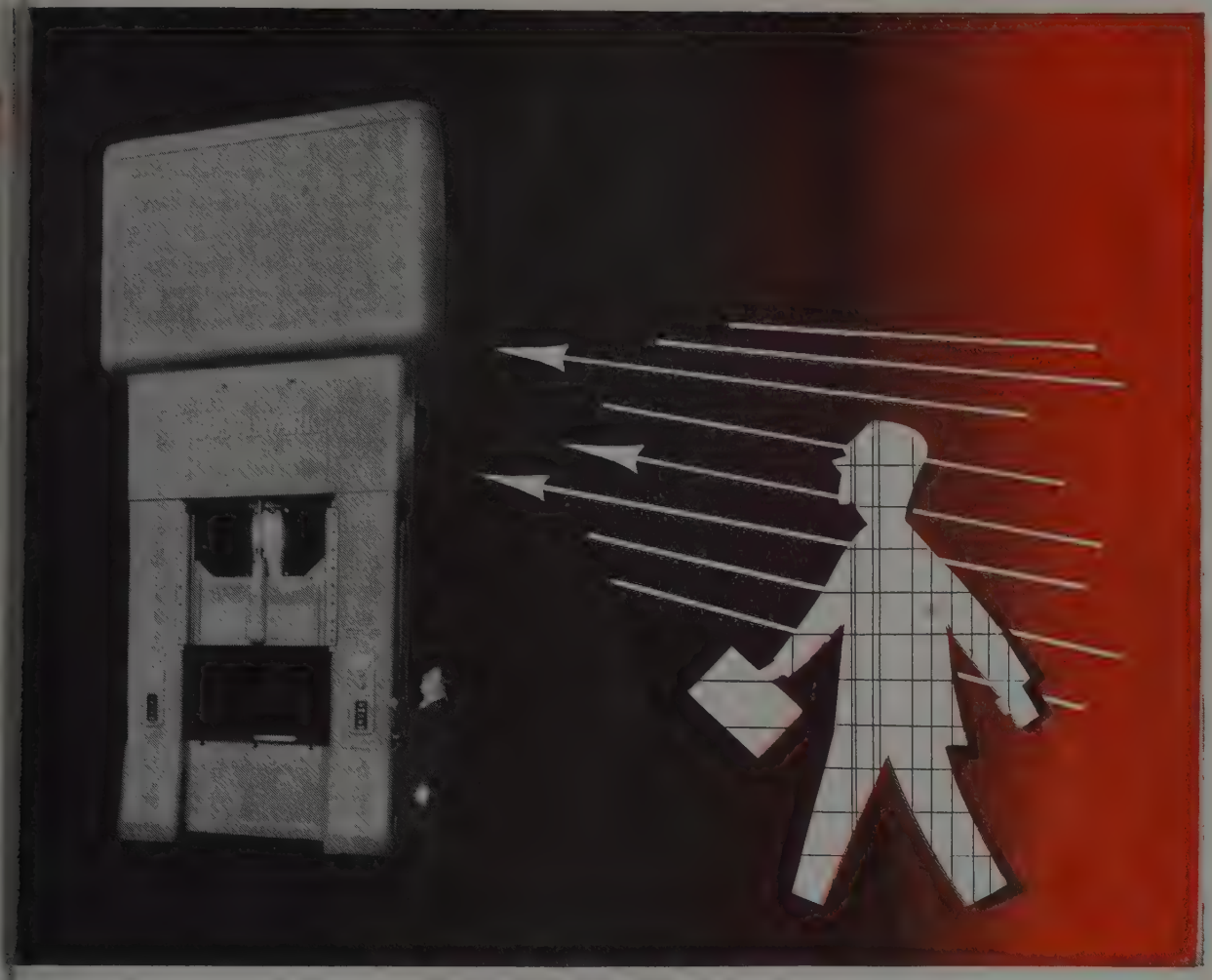
ACCURACY-RIGIDITY-POWER BARBER B-C COLMAN FOR HI-PRODUCTION HOBBING

Barber-Colman Company

GENERAL OFFICES AND PLANT 121 LOOMIS ST., ROCKFORD, ILLINOIS U.S.A.

ABOUT THIS JOB—

Part — Reduction Drive Gear, 76 teeth, 12/14 DP, 6.492″ OD, ¾″ face.
Material — SAE 4320, 170-207 Brinell
Feed — .068″ per rev. of work Speed — 180 RPM
Cutting Time — 14 min. per load of 2.
Hob Life — 10 settings, 10 pieces per setting, 100 pieces per sharpening



Get into the **BLACK**

with a *BALDWIN HYDRAULIC PRESS*

When you consider your next press, remember this: Southwark hydraulic presses are designed not only to make good *products* for you . . . but to make good *profits* for you.

Almost any press can show a return while demand is high . . . but when competition is keen, it's the extra margin of performance *from a press exactly suited to the job* that keeps you in the black.

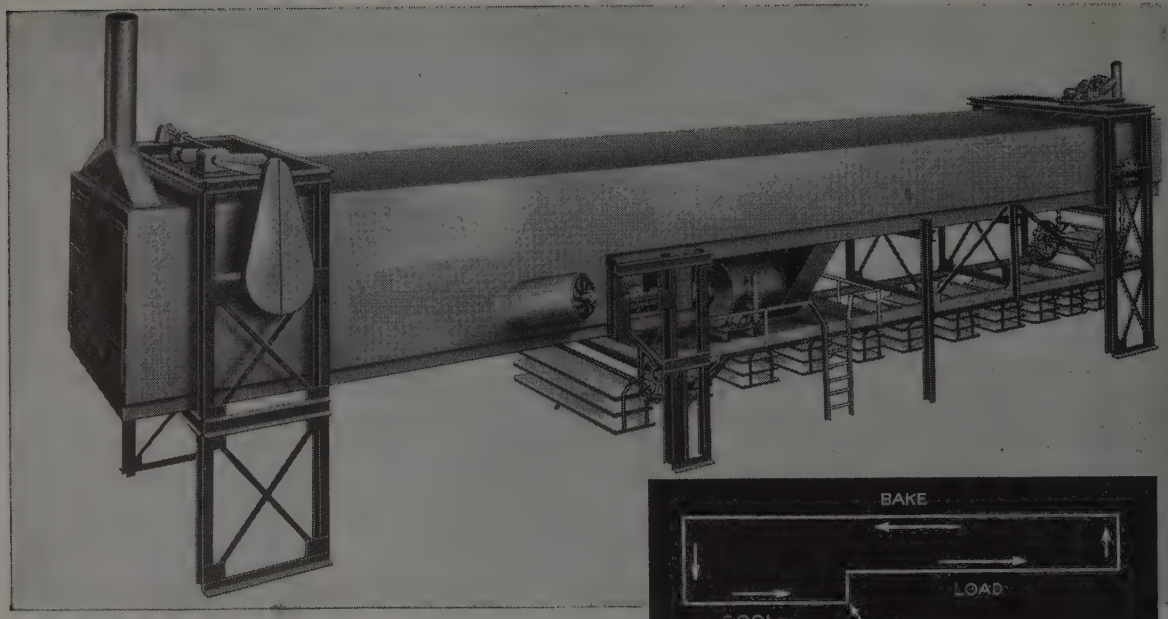
You'll find, at Baldwin, a *Standard line of modern presses* with features and advantages that you would ordinarily expect only in *custom-built* equipment. You'll find a range of sizes that takes care of a wide variety of production needs. You'll find representatives that understand your problems, and that can work with you in applying the proper press to the proper job. You'll find the engineering talent and experience of one of the country's oldest and largest press manufacturers always on call.

We'll be glad to talk over the profit possibilities of Baldwin presses with you at your convenience.

BLW THE BALDWIN GROUP **BALDWIN**

HYDRAULIC PRESSES

Write or telephone The Baldwin Locomotive Works, Philadelphia 42, Pa., U.S.A.
Offices: Philadelphia, Chicago, St. Louis, Washington, New York, Boston, San Francisco, Birmingham, Houston, Cleveland, Detroit, Pittsburgh, Norfolk, Seattle.



New HORIZONTAL CORE OVEN . . . . . offers many cost saving advantages!

The time-saving, space-saving, compact design of this new Horizontal Core Oven is characteristic of Young Brothers' Engineering. Into it went the skill and confidence of many years of experience . . . also a thorough knowledge of the job to be done and the production problems involved.

This new core oven can be installed in practically any building without making any major structural changes.

The coremakers are located right next to the oven so that they can load the cores directly on the moving racks thus eliminating the necessity of transporting them on hand trucks or a conveyor from the core room. The location of the coremakers, at the oven, also saves core room space.

The size of the loading racks can be varied and the shelves can be adjusted to accommodate cores of many sizes and shapes.

Besides allowing for the removal of exhaust gases at the point of greatest concentration, the new oven design provides an effective cooling zone for the cores and assures comfortable working conditions for the coremakers.

This New Horizontal Core Oven is Young Brothers' answer to the demand for better core baking equipment. It is YOUR answer to the need for lower production costs and higher operating efficiency.

MANUFACTURER'S ASSOCIATION, INC. FOUNDRY EQUIPMENT MEMBER

YOUNG BROTHERS COMPANY

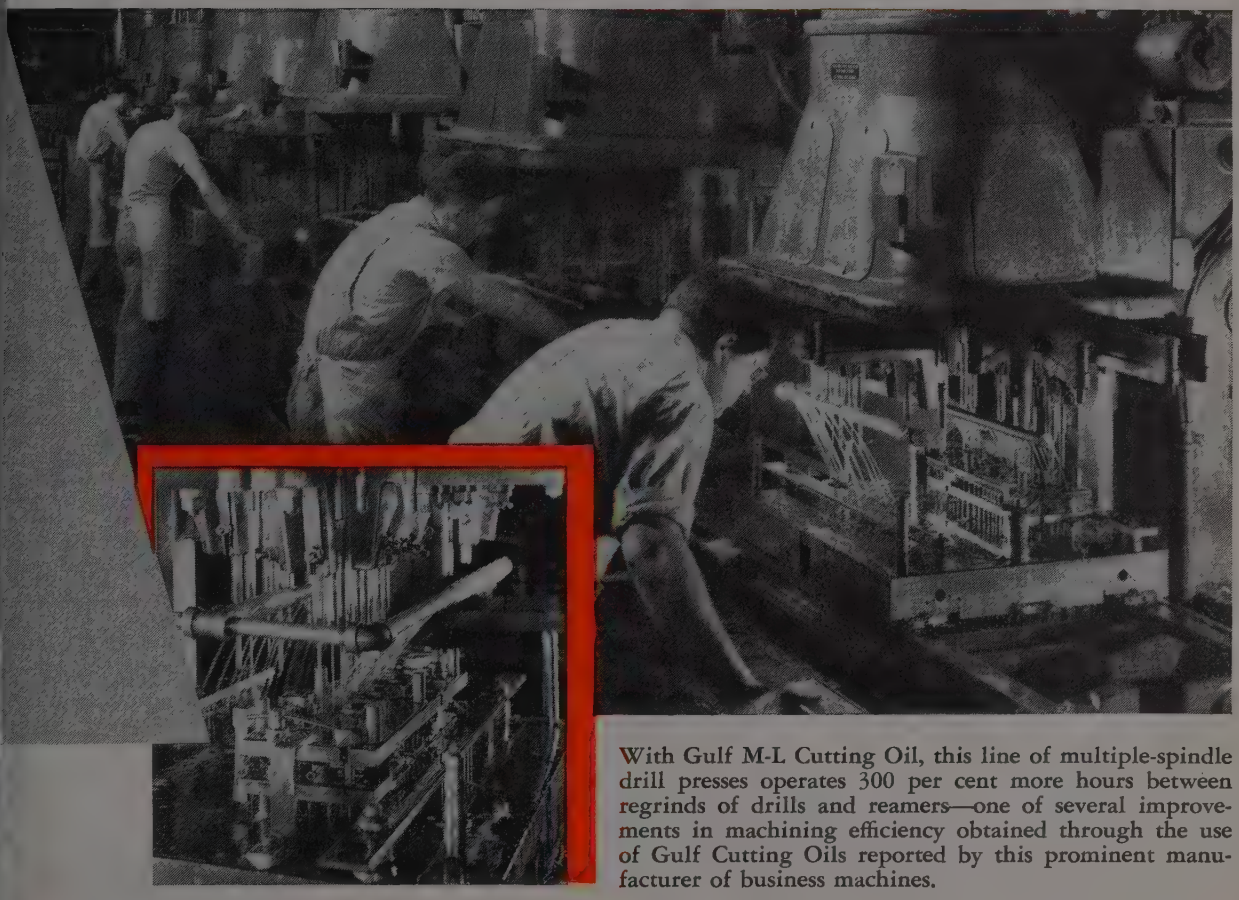
6503 MACK AVENUE · DETROIT 7, MICHIGAN

YB Co ESTABLISHED IN 1896

Drills and reamers formerly reground every 20 hours:

now with Gulf M-L Cutting Oil

every 80 hours!



With Gulf M-L Cutting Oil, this line of multiple-spindle drill presses operates 300 per cent more hours between regrinds of drills and reamers—one of several improvements in machining efficiency obtained through the use of Gulf Cutting Oils reported by this prominent manufacturer of business machines.

THIS IS ONE OF HUNDREDS OF SHOPS that report improved machining practice through the use of the proper Gulf Cutting Oil for each job!

Gulf quality cutting oils can help your machines gain an edge in efficiency—mighty important for the period of keen competition just ahead! Here's the important reason: Every Gulf Cutting Oil has specific properties which insure better performance on certain types of jobs.

Call in a Gulf Lubrication Engineer today and let him show you how Gulf Cutting Oils can help you increase production and tool life and get better finishes. Write, wire, or phone your nearest Gulf office.

Gulf Quality Cutting Oils

- Gulf Lasupar Cutting Oils A, B, and C
- Gulf Electro Cutting Oils A, B, and C
- Gulf M-L Cutting Oils A, B, and C
- Gulf Cut-Aid
- Gulf Cutx B
- Gulf L. S. Cutting Base A and B
- Gulf Soluble Cutting Oil A

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION
GULF REFINING COMPANY

Division Sales Offices:

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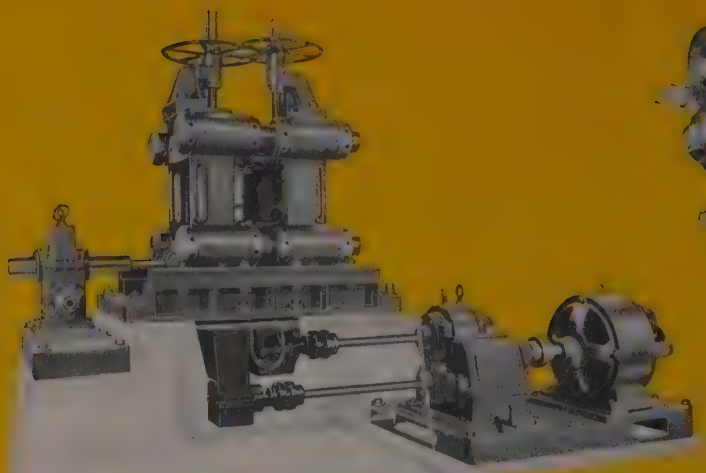
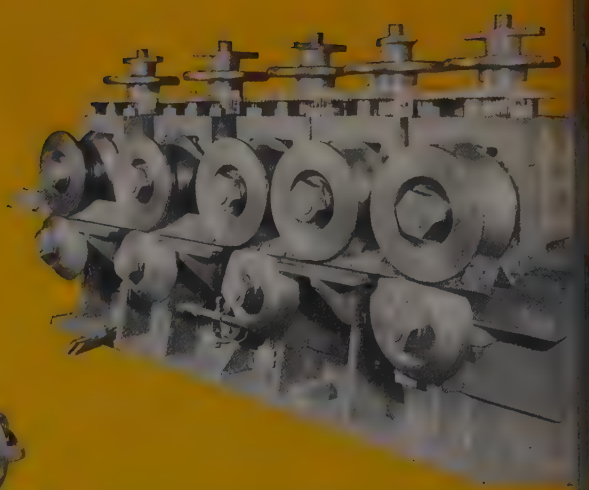
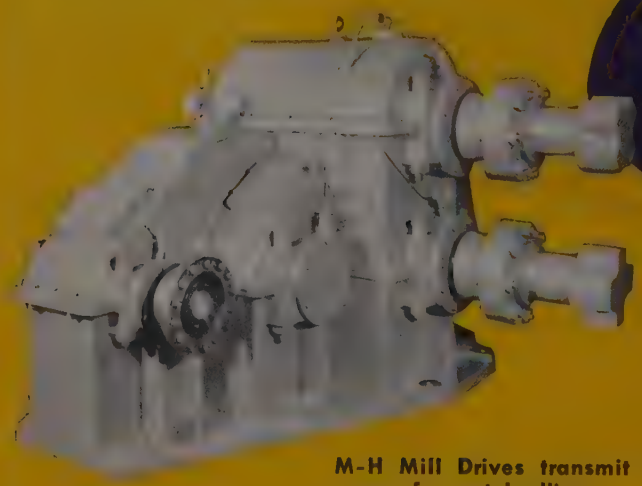


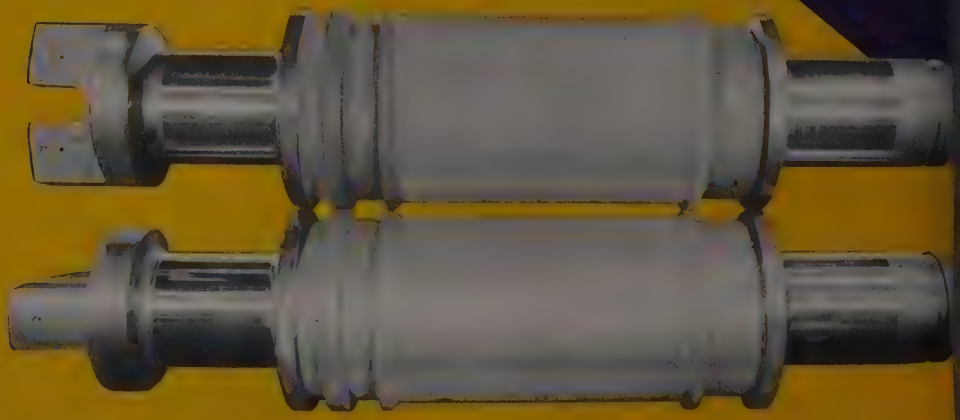


M-H Angle and Shape Straighteners, part of the M-H line of straightening equipment.

M-H Precision Mills assure rigid specification tolerances in rounds or shapes.

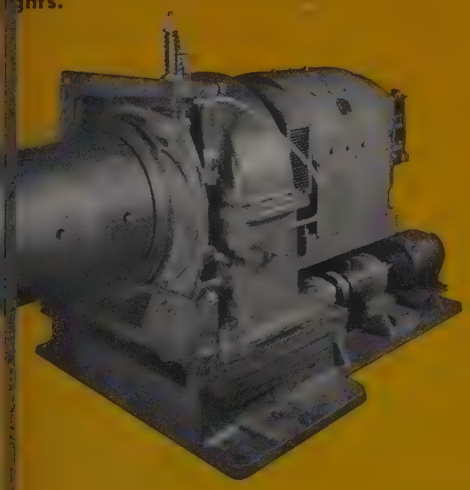


M-H Mill Drives transmit the power for metal-rolling.



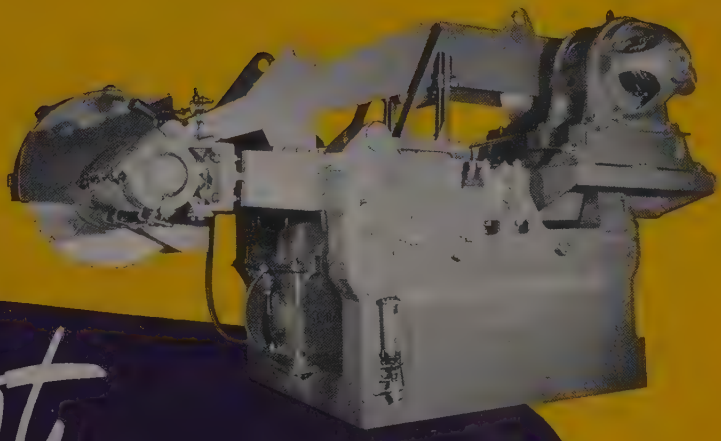
Rolls with the Red Wabblers will make short work of your production rolling operations.

Strip Coilers for all types of
als, in all widths and coil
ghts.



M-H Heavy-Duty Lathes for the special productioneering requirements.

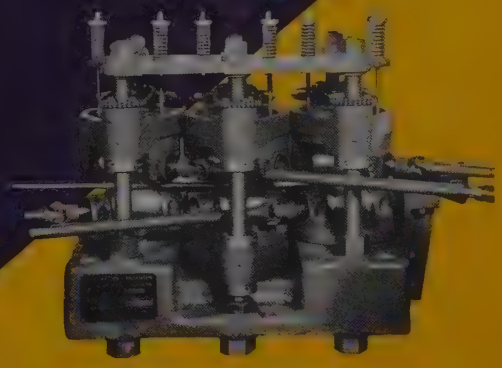
M-H Swing Type Hot Saws, and various types of shears, for high-speed cutting operations.



appointment

with Mackintosh-Hemphill

our three minute reading-time appointment will
emind you of the widely diversified types of production
achinery manufactured by Mackintosh-Hemphill, and point out
hat the Mackintosh-Hemphill engineering, metallurgical
nd manufacturing staffs are engaged constantly in the development
f production equipment for the metals industry
will be worth your time to keep an eye on
what's new at Mack-Hemp, to investigate these and other types
f Mackintosh-Hemphill production machinery.



Mackintosh-Abramsen Straighteners remove all end-bends, leave no score-marks on finished products, require minimum setting-up time.

MACKINTOSH-HEMPHILL CO.

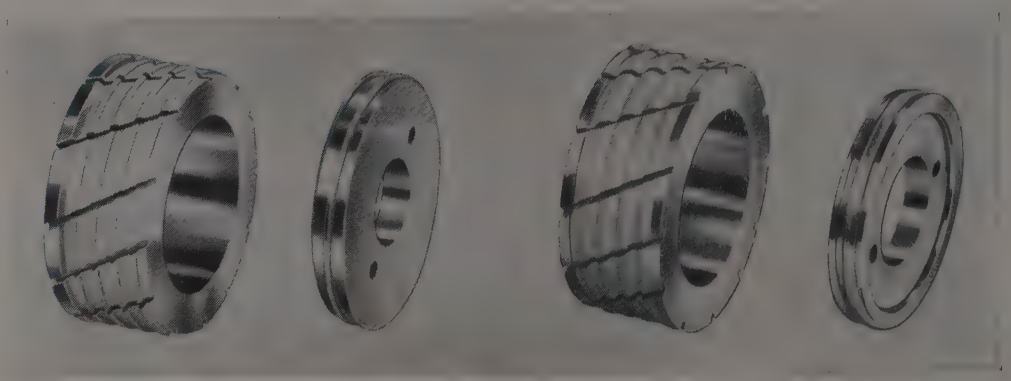
PITTSBURGH—MIDLAND, PA.

Makers of the rolls with the Red Wabblers

SHEFFIELD MACHINE TOOL DATA

MFG #111

CRUSH GRINDING CUTS MANUFACTURING COSTS OF SMALL AND LARGE SCREW CAP FORMING ROLLS



From left to right – (1) Crusher roll for truing the grinding wheel used to produce the internal die; (2) The resultant internal die; (3) Crusher roll for external die; (4) The external die.

The inner and outer rolls or dies used to roll the thread on jar lids have heretofore been made by chasing on a lathe with a tool formed to the desired thread profile. The rolls are then heat treated and polished. Distortion of form occuring in heat treating is a common cause for rejects.

This problem has been eliminated, production time greatly reduced and uniformity of quality assured by the following methods:

(1) Crusher rolls to desired thread profile are made on standard H.S.S. blanks with the Sheffield Micro-Form Grinder.

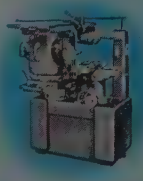
(2) The resultant crusher roll is used to dress a 120 grit wheel on the Sheffield Precision Thread and Form Grinder

(3) This Sheffield Precision Thread and Form Grinder is then set up to grind the dies in quantity with two passes of the grinding wheel over the work.

While it was possible to produce the form in a single pass at reduced work speed, the most desirable combination of production time and product finish was obtained by taking two passes, one for rough grinding and one for finish grinding.

In grinding, two parts were placed on an arbor. Total grinding time per part was slightly under 4 minutes. Approximately an hour's labor per die is saved by using crush grinding on Sheffield equipment, and the die so produced is more uniform in quality and the finish is better.

Thousands of other production cost problems can be answered satisfactorily by crush grinding with Sheffield equipment. Write for Bulletins M-100-145 and M-120-144.



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Annealing Salt for 18-8
New Axial Air-Gap Motor
Bethlehem's Expanded Tool Steel Department
Drawing Steel with Zinc Alloy Dies

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 120, NO. 23 JUNE 9, 1947

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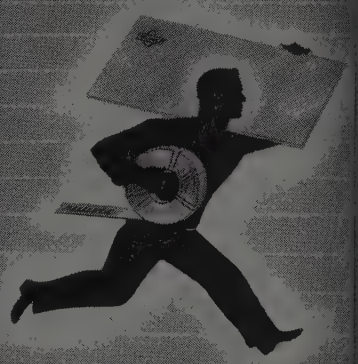
It's Gotta Fit...



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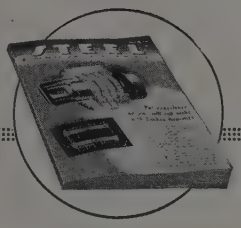


June 9, 1947

Realism Vs. Fantasy

It is encouraging to note that today realism overtakes fantasy much more promptly than was the case a decade ago. In the heyday of the New Deal a fallacious economic theory could be pursued by a large majority of the people for years before the cold truth of reality plunged it into the discard. Today fantastic ideas are shorter lived.

For example, take the problem of prices. Everybody agrees that prices should be lower but few can agree as to how that can be achieved. Less than two months ago President Truman was asking business to reduce prices, although he was deaf to suggestions that the government was promoting high prices through subsidies, high taxes, an abnormally high peacetime federal budget and administrative espousal of substantial wage increases for union members. Newburyport merchants took the President's appeal seriously, reduced prices at the retail level and waited for distributors and manufacturers to back them up.

In general, the nation gave respectful attention to the presidential appeal. Hardheaded men who knew it wouldn't work kept silent or voiced their criticisms softly. In many quarters there was a feeling that if the President's request could start a psychological movement toward lower prices, nothing should be done to prevent it.

The Newburyport stunt faded quickly. The President has scarcely mentioned prices for several weeks. Today if it were possible for a person to attend all of the scores of conventions being held, he would be impressed by the uniformity with which executives in every branch of industry, after analyzing all pertinent factors, declare that in view of increased wages and other rising costs, prices in general cannot be reduced immediately and may rise before they descend.

Here is realism overtaking fantasy in less than 60 days!

This realism convinces us that it is business itself upon which the burden of reducing prices must fall. Management must apply the efficiencies in the use of manpower and equipment that will reduce costs and permit lower prices.

This being true, why is it not in order for President Truman to approve the labor relations bill and the tax bill, which would help business to lower costs? Why also is it not in order for Congress to tackle some of the federal policies which are maintaining prices at inflated levels?

Business management can eventually reduce prices. It can do it more quickly if the government will remove some of the high hurdles in its path.

• • •

BOSS KET LOOKS AHEAD: American manufacturers will do well to ponder the implications of the paper on automotive engine development presented by Charles F. Kettering, retiring head of General Motors Research Laboratories, before the Society of Automotive Engineers at French Lick last week.

During the past three decades changes and improvements in engines and fuels have brought a one-third improvement in fuel economy. Compression ratios have been increased from 4 to 1 to 6.5 to 1, octane ratings have been raised to around 80, engine speeds have been doubled and power output increased two to three times.

Mr. Kettering now envisions a further improvement to be achieved progressively during the next few decades. It will involve changes in the structural design of power plants and improvements in fuel that will permit a gradual increase in the compression ratio from 6.5 to 1 to an eventual 12.5 to 1 and the use of a gasoline with a 99 octane rating.

Performance on this order would require engineers and designers to deal with drastically higher pressures and temperatures and would call for pro-

(OVER)

gressive modifications in crankshafts, connecting rods, pistons, bearings, valves and other components to say nothing of changes in the petroleum industry required to shift to volume production of the new fuels.

Practically every supplier and manufacturer dealing with the automotive industry in time will be affected by the developments "Boss Ket" outlined in his significant "valedictory." —p. 61

° ° °

THREE $64 QUESTIONS: Theme of the 32nd annual convention of the National Association of Purchasing Agents—How Much? When? For How Much?—has been pretty much the topic of discussion at most of the industry conventions held this spring.

Answers to these questions presented at the Waldorf last week covered numerous products in tight demand. Early freer supply was forecast for a number of rolled steel products and gray iron castings, but it was predicted that balance between supply and demand for flat rolled steel, merchant pipe, wire, malleable iron castings and pig iron is not yet in sight.

Leo Wolman of Columbia University summarized the present situation by saying that the major current maladjustments are that prices are higher than the economy can sustain, that much of the existing pent-up demand cannot be translated into economic demand at present costs and that there will have to be downward adjustments in prices and probably in wages. —p. 50

° ° °

MORE STEEL IN ROADS: Highway construction sufficient to make up for the 5-year wartime recess in road building and to provide suitable highway facilities for the 50 million cars and trucks that probably will be in service in 1960 will require much more steel per mile of highway than in prewar experience.

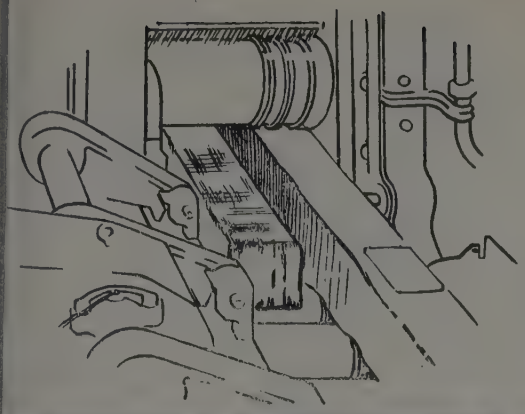
Public Roads Administration is planning for 40,000 miles of 4-lane express highways with shoulders of full width that will continue uninterruptedly across new bridges. These roads will be free of grade crossings. It is obvious that the tonnage of steel required for ramps, culverts, tunnels, overhead crossings and guard rails on highways of this type will be substantial.

PRA hopes to hold down road construction in times of inflation and to expand it in times of recession. However, pressure of traffic and safety call for prompt action on numerous traffic bottlenecks. PRA has listed 8 large 4-lane bridges that are urgently needed now. —p.56

SIGNS OF THE TIMES: Demand for builders' hardware will be brisk for several years, with the peak expected in 1948 or 1949. Fifty-seven plants producing locks, keys, latches, hinges, butts, knobs, door closers, stops, hasps and similar items (p. 58) will consume 95,000 tons of steel in 1947. The year's output of the industry may exceed $100 million in volume. . . . Dresser Industries Inc. has received orders from Russia for eight deep-drilling rigs, 26 portable drilling rigs, 10 portable clean-out rigs, over 100 pumping units, a liquid methane plant and other equipment (p. 64) to be used in a 5-year plan to rehabilitate oil and gas fields in the U.S.S.R. . . . Britain's Conservative party has issued a statement of industrial policy under the title "The Industrial Charter" (p. 57) in which it emphasizes the need of definite priorities for coal and power, transport, capital equipment and housing and food and agriculture. It opposes nationalization of industry in principle but does not believe it will be desirable to restore the coal industry and the Bank of England to private ownership. . . . Willys-Overland has exported 27,586 jeeps and jeep station wagons valued at $32 million (p. 62) during the past 15 months. . . . Composite sheets of wood and metal have a surprisingly high resistance to bending. For instance, a ⅜-in. panel consisting of zinc-coated steel sheets on both sides of a plywood core and weighing 2.56 lb per square foot (p. 76) is about 75 times stiffer than a sheet of 16-gage steel weighing 2.5 lb per square foot. . . . Commenting on the high cost of plant expansion and replacement (p. 51), President Charles M. White of Republic Steel told members of the National Industrial Conference Board that a battery of coke ovens which originally cost about $1 million and which should be replaced soon, if replaced now would cost between $3½ and $4 million. . . . Only two direct allocations remain in the federal housing program (p. 56)—pig iron to producers of cast iron soil pipe and shop-grade lumber to millwork manufacturers. . . . Testimony presented before the Senate Small Business Steel Subcommittee is producing spectacular smoke (p. 46) but to date little real fire has been discovered. . . . Experience in operating Republic Steel's No. 5 blast furnace at Cleveland at high pressure (p. 102) indicates increased efficiency resulting in a saving in manufacturing cost of more than $1 per ton of pig iron.

E. L. Shaner

EDITOR-IN-CHIEF



Inland's 60,000,000th Ton of Steel...

John Rudolf
Superintendent

Michael Ramirez
Third Helper

Walter Padziwiatr
First Helper

Ben Barr
Melter Foreman

....Here are the men who helped produce it

Inland Steel Company has just produced its 60,000,000th ton of ingot steel. The record ton, one of 99 in the heat, was rolled into merchant bar angles.

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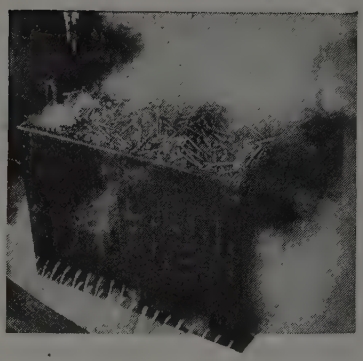
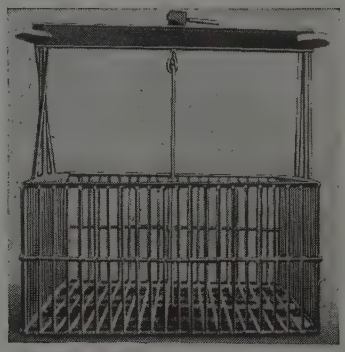
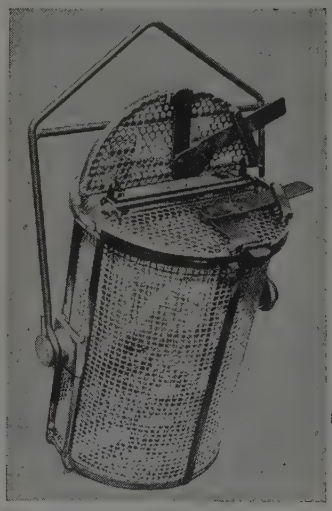


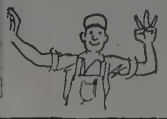
1. HERE'S A 307-POUND WELDED BASKET of perforated Monel* sheet. Capacity 2,500 pounds of bolts —10% more than the same size wood basket it replaced. Sharp edges can't chew into Monel. Metal construction gives easy acid flow and prevents uneven pickling.

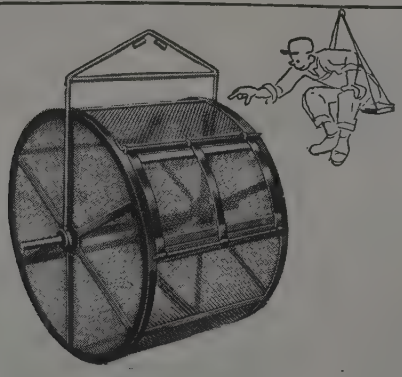


2. NEXT, A SIMPLE AND STURDY BASKET. Made entirely of corrosion-resistant Monel bar, it was welded by ordinary shop methods. The pin at top center is for hooking onto an overhead conveyor. Side index plates lock into the conveyor when the basket is carried. With a tensile strength of 80-95,000 psi, hot rolled Monel bar is a wise—and safe—choice for a job like this.

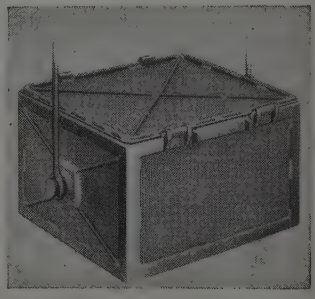


3. A COMBINATION OF THREE FORMS of Monel — screen, sheet and bar. This revolving basket weighs 220 pounds, and has a capacity of more than 500. The unique top fastening permits fast and *complete* dumping. Because of Monel's toughness and ductility, a basket like this stays in service long after others have hit the scrap heap.





4. STILL ANOTHER combination, this time of Monel angles and flats, welded together and covered with Monel wire cloth. Hanger and shaft are Monel rod. In all forms, Monel provides high resistance to pickling solutions commonly used by steel mills.



5. SMALL PARTS won't hop out of this all-Monel basket. *They're locked in.* The basket lid is easily removed for loading and unloading.

*Reg. U. S. Pat. Off.

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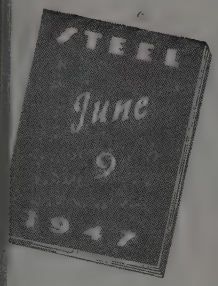
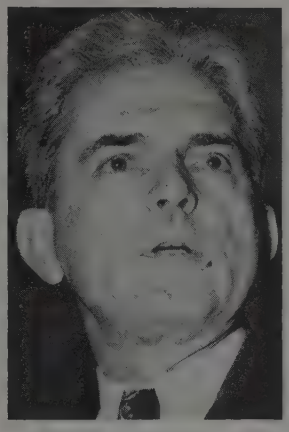


EDWARD MARTIN



SPESSARD L. HOLLAND

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Members of Steel Subcommittee of the Senate Small Business Committee investigating the "gray" market in steel

HARRY P. CAIN

ALLEN J. ELLENDER

Restoration Of Pittsburgh Plus Sought

Spokesman for pressed metal group, in brief filed with Senate Small Business Committee investigating "gray" market in steel, asks return to former practice. Attributes supply difficulties in part to abandonment of system

CONSUMER support for the basing point system of pricing in the sale of iron and steel products, long under attack by the Federal Trade Commission, is developing as an outgrowth of tight supply conditions now prevailing in the steel market.

In some respects, this is a change of viewpoint approximating almost a complete flip-flop in thinking on the subject of steel pricing on the part of many steel buyers who for years vigorously pressed for elimination of "Pittsburgh Plus," and who in more recent years encouraged the FTC in its drive to effect fob mill pricing in the steel industry.

For some time past basing point pricing has been under study by various consuming groups and there has been some talk of initiating a movement aimed at restoring the "Pittsburgh Plus" system which was definitely abandoned in 1938. All of this has been more or less informal in nature. Last week, however, the beginning of a formal move to return to "Pittsburgh Plus" was launched at the Senate Small Business Subcommittee hearing into "gray" market steel operations, when Tom J. Smith Jr., president, Pressed Metal Institute, on behalf of his organization, filed a brief with the committee, prior to his appearance as a witness, in which restoration of "Pittsburgh Plus" is asked.

Mr. Smith's brief, a 19-page statement, copy of which was sent to the FTC, details the position of the pressed metal industry in the postwar industrial picture and outlines the difficulties individual stampers have been encountering in obtaining adequate supplies of steel. It is reported some stamping shops are operating at only about 50 per cent of capacity, and a number have been forced to close temporarily because of lack of steel. Some of their steel supply difficulties are attributed to abolition of "Pittsburgh Plus" pricing.

In his brief Mr. Smith points out that throughout the war and until V-J Day the stampers encountered no serious difficulty in obtaining the sizes and gages of steel products required for the war effort. With elimination of price control and abandonment of government allocations, however, the stampers' difficulties began to mount as they switched to peacetime manufacturing.

"Part of these difficulties arose from the abolishment in 1938 of the 'Pittsburgh Plus' pricing system heretofore standard throughout the steel industry," states the brief. "Under this system of pricing a buyer in Duluth who bought steel for delivery in Duluth paid the Pittsburgh price plus equivalent freight to Duluth, irrespective of whether he bought the steel in Duluth, in Chicago, in Pittsburgh, or wherever.

"While it is true that this system of

pricing worked a seeming hardship on the stamper at some distance from Pittsburgh when purchasing from mills closer to his base of operation, it nevertheless provided steel equal in price to that from any mill anywhere, and consequently the stamper had a wide latitude of choice of materials, all at the same price. With the abolishment of the 'Pittsburgh Plus' pricing system, the Federal Trade Commission took the position that with the withdrawal of mills from their more distant markets there would be some dislocation of the distribution pattern, but since such withdrawals would be roughly balanced between the different mills, it should be possible for the nearby mills to serve business which has been dropped by their distant competitors, and thus afford the steel user an opportunity of securing steel from a nearby mill.

Dislocations Persist

"The assumption that the nearby mill would automatically pick up the slack occasioned by the withdrawal of the more distant suppliers from certain local markets was, like many assumptions in the past that had bureaucratic origin, not sustained by reduction to practical application. In the first place, when the majority of the steel mills resumed shipping steel for postwar production of consumer durables, the allocation of this steel was based in part on the historical background of the customer with that particular mill. When the customer left his old connection, and many of these connections were in operation for years, he lost his historical position and was at great disadvantage in establishing a new connection at a mill closer to his base of operation, because he often had no historical background with the new mill source. It was hardly feasible for the new mill to make room for a newcomer at the expense of older customers who had favored the mill with business for years. Furthermore, the mills closer to his base of operation did not always roll the gage, size or kind of steel that the stamper had been accustomed to use."

Smith's brief declares that there is apprehension in many quarters that at some inopportune time the Supreme Court might legislate judicially and establish by judicial decree that mills shall be restricted to selling their products fob the individual mills. Many buyers, he states, are fearful that such judicial legislation would still further aggravate an already very uncomfortable situation.

Thinking men in the stamping industry, Smith's brief states, believe that the restoration of the "Pittsburgh Plus" procedure would be far preferable to the best interests of both makers and purchasers of steel, than the current procedure (multiple basing point system), or the "more hazardous fob mill procedure."

Just what action will stem from Mr. Smith's request for restoration of "Pittsburgh Plus" is problematical since it is diametrically opposed to long-established government policy. However, a mass of evidence has been collected at the Senate Small Business Subcommittee hearing into the "gray" market which points emphatically to the fact that some of the steel supply troubles of the present are traceable to dislocations arising from revision of the historic pricing policy of the steel industry. Some observers think that possibly a move may stem from the hearing aimed at cutting off further tampering with the steel pricing system.

Significantly, basing point pricing was discussed extensively at the annual convention of the National Association of Purchasing Agents in New York last week. At this meeting H. Thomas Austern, partner, Covington, Burling, Rublee, Acheson & Shorb, Washington, asserted that if the Federal Trade Commission succeeds in forcing all pricing on a fob mill basis an "economic revolution" would be the result for many industries.

Incidentally, some eastern steel warehouse operators express concern over market dislocations resulting from steel shipment policy changes. Pittsburgh, Youngstown and Midwestern steel mills are being scared out of shipping flat rolled products to their eastern consumers by fear of future freight absorption costs which may run as high as $4 per ton or more if a new basing point is established at Sparrows Point, Md. the warehouse men state.

Senate Committee Seeks Details Of Steel Gray Market Operations

WASHINGTON

DESPITE some sensational testimony at the Senate Small Business Subcommittee's investigation of "gray" market steel deals, it seemed apparent last week that no very substantial irregularities in marketing are being uncovered.

The investigation has disclosed numerous stories of high-priced steel, and of mystery offers of steel but the evidence indicates that by the time the steel reached the "gray" market, it had lost all touch with its original producers.

The names of some reputable firms have been brought into the investigation but the committee appears to be largely grasping at fringe elements in the business, and at deals involving "orphan" steel.

After a week-long build-up toward testimony by a supposed "mystery man," the witness appeared, and with the FBI, exploded as false some of the more sensational stories involving proposed large bonuses to executives of steel companies. Other witnesses denied earlier stories of gun-play in hotel rooms during negotiations for "gray" market steel. An FBI handwriting expert took a letter which had led the committee into investigation of a supposed $50 million "gray" market transaction, and testified the signature and letter were forged.

L. Gerald Firth, president, Firth-Sterling Steel & Carbide Corp., McKeesport, Pa., whose company was stated in the supposed letter as promising delivery of the steel, said he had never seen the letter, and had never dealt in sheet steel. A. R. Zapp, also named in the letter denied signing it, and denied any dealings with the "mystery man."

It was reported at the hearing last week that apparently racketeers have been using stolen letterheads to advance their operations. In one instance of this kind, Bethlehem Steel Co. letterheads figure, they having been stolen from one of Bethlehem's offices and used by the racketeers in "confirming" orders for steel from gullible buyers. The FBI is now investigating this angle.

The present unprecedented shortage of sheet steel should be completely eliminated by the time new facilities now under way throughout the industry are completed during 1948, J. L. Block, executive vice president, Inland Steel Co. Chicago, told the Senate subcommittee. This witness contradicted much of what had been told in earlier hearings. He said many efforts have been made to locate the fantastic tonnages offered, but it has long been apparent that most of these offerings is just empty talk of speculators and charlatans.

Mr. Block's presentation to the Steel Subcommittee is summarized as follows:

"1. We have never knowingly engaged in any transactions which have resulted in the charging of exorbitant or so-called black market prices to consumer.

"2. We have made every possible effort to expand our production currently and for the future.

"3. We have taken the utmost care to distribute our steel equitably in these times of shortage.

"4. We have continued and extended r traditional policy of serving smaller usinesses."

In his statement, the Inland Steel ex- utive discussed the so-called black arket, equitable distribution, steel al- cation, efforts to increase production, e supply and demand picture, effect strikes on production, reasons for the eet steel shortage, steel conversion ar- ngements, and gave the details of one el transaction which had been pre- ously presented to the committee.

Earlier, David L. Wilkoff, Pittsburgh, scribed an arrangement he had made obtain sheets in exchange for pig iron d scrap, a part of which steel was sold the domestic market at "a profit com- ensurate with the risk," and with the gh cost of ingots, pig iron and scrap tering the finished product.

Reuther Asks for Inquiry

An important development of the past eek involved the submission to the nate committee of a number of recom- endations for inquiry into the steel pply situation as it affects the auto- obile industry by Walter P. Reuther, resident, United Auto Workers union. he recommendations were prompted by e reported closing of automotive plants ue to the lack of steel with conse- ent layoffs of labor.

Reuther asked that the committee ex- nd its investigation to include an exami- ation of the overall problems with re- ect to capacity, production and dis- ibution in the steel industry. He sug- sted eight specific lines of inquiry.

Several points overlooked by Reuther his complaint are these: Percentages o not tell the story of steel distribution. ctually, in tonnage the auto industry receiving more steel than in 1940, though less percentagewise. The reason of course that all steel-using indus- ies are clamoring for tonnage, plus undreds of new industries which started uring the war and are attempting to ep going in various fields of manufac- ured metal goods.

Furthermore, the number of units pro- uced by the auto industry does not tell e true story in steel being consumed. here were nearly 1 million trucks and usses produced in 1946, a record high or all time. In 1940, for example, sta- istics show production of only 703,000 rucks.

Beyond this, consideration must be iven to the fact replacement parts pro- uction is probably four or five times the evel of 1940, and most of these require teel in one form or another.

Distribution or allocation of steel is eing handled by individual companies n the most equitable basis they can etermine. It is certainly impossible to egislate the distribution of steel, which is nothing more than "rationing" which never works.

The insinuation that the Institute is "covering up" something in its "unclassified" tonnage is nothing more than puerile.

The discrepancy between December and March reports on 1946 probably is accounted for by the fact the December announcement included only tentative figures for that month, which were later revised to the accurate total.

In a letter to Sen. Francis J. Myers (D., Pa.) of the Senate Committee on Interstate & Foreign Commerce, Norman W. Foy, general manager of sales, Republic Steel Corp., Cleveland, last week said that none of the large, reputable steel producers have at any time knowingly made sales of steel that could get into any irregular channels. Republic Steel, he said, has diligently pursued every report that involved its product in "gray" market transactions and has found all such tonnage offers to consist entirely of talk.

He said that "It is quite apparent that the 'evidence' which Mr. Smith (Tom J. Smith Jr., president, Pressed Metal Institute) has sent to the American Iron & Steel Institute is not evidence at all, since he describes it as the 'actual names of those making the offers.' It has been our experience that such 'evidence' amounts to nothing, since such parties invariably either deny using a producer's name in making the offer, or claim the information was given them by some third party, who is equally hard to pin down.

"The only real evidence of such transactions would be proof that shipments of steel have actually been made, received, and paid for at these exorbitant prices. All of our investigation indicates there is very little tonnage which can be considered in this category and it seems to me the present hearings before the Senate Subcommittee on Small Business tend to bear out this conclusion."

He emphasized that Republic has not shipped and invoiced one pound of steel except to its legitimate regular customers at regular market prices.

Present, Past and Pending

■ STEEL COMPANY TO HAVE AUXILIARY GAS SUPPLY

PITTSBURGH—To guard against shortage of natural gas next winter, Allegheny Ludlum Steel Corp. is installing at its Brackenridge, Pa., plant 20 tanks to hold 360,000 gallons of propane, equal to 32,725,000 cubic feet of natural gas.

■ NEW CONTRACT ENDS 24-DAY STRIKE

CLEVELAND—A new contract providing a wage increase of 11½ cents an hour and six paid holidays a year has ended a 24-day strike of 2500 employees in the Eaton Mfg. Co.'s axle and heater plants.

■ DELIVERY OF NEW FORD TRACTORS TO BEGIN JULY 7

DETROIT—Deliveries of new Ford tractors through Dearborn Motors Corp., a Ford subsidiary, will begin July 7, six days after Ford's contract to make Ford-Ferguson tractors expires. Initial production will be 400 daily.

■ BLAST FURNACE REBUILT IN 123 DAYS

DUQUESNE, PA.—Rebuilt in 123 days, No. 6 blast furnace at the Duquesne Works of Carnegie-Illinois Steel Corp. is again making iron. Normally, rebuilding of a blast furnace takes a year or longer.

■ LABOR SURPLUSES REPORTED DEVELOPING

WASHINGTON—Labor surpluses have developed in 22 of 80 reporting labor market areas, the U. S. Employment Service says. Half of the 80 areas reported definite declines in future labor requirements.

■ BOEING AIRPLANE CO. GETS $10 MILLION ORDER

WICHITA, KANS.—Boeing Airplane Co. has received contracts for $10 million worth of spare parts for servicing Army Air Forces B-29 bombers, and for construction of ten YL-15 liaison planes for the AAF.

■ FABRICATOR CONTINUES WITH SALE PLANS

LOS ANGELES—Consolidated Steel Corp. will hold a stockholders' meeting soon to approve sale of its assets to Columbia Steel Co., a U. S. Steel Corp. subsidiary. Recent federal district court injunction prevents consummation of the sale pending a government antitrust suit but does not prevent steps being taken toward carrying out a sale agreement.

Gearmakers Emphasize Economy in Operations at Annual Convention

Speakers stress need for return to economy in plant operations as antidote for increased production costs. Record attendance at 31st annual convention at Hot Springs, Va. Raymond B. Tripp elected president

THE 31st annual meeting of the American Gear Manufacturers' Association, held at the Homestead, Hot Springs, Va., June 1-4, showed attendance of 275, which was a record for this association as far as any meeting at a resort hotel is concerned.

Problems involved postwar readjustments of the gear industry. Both technical and business problems received analysis by a number of speakers and discussers, a number of whom came from as far away as the Pacific Coast where, incidentally, a number of large gear plants now are in active operation. It is a sign of the times that Thomas J. Bannan, retiring president of the association, is from Seattle.

In his address marking the close of his administration, Mr. Bannan emphasized the necessity for a return to basic principles of Americanism on the part of the American workers. The responsibility for convincing them of this fact rests heavily upon management, he said, and in his estimation management is not doing a good job of getting this fact over to workers. It is a tough assignment; it requires tact and patience, but it can and must be done, he said.

Subject of statistical reporting on the state of the gear industry is being taken up more seriously than ever before. D. T. MacCartney, statistician of AGMA, went over the plans and urged that all members contribute information so that trends can be charted in detail. Handbooks on accounting methods are contemplated for small as well as large member companies. The industry now is operating at a satisfactory level.

The important subject of labor-management relations was detailed by guest speaker George Hodge, assistant vice president, International Harvester Co. Mr. Hodge advocated over the table discussion with the proviso that the company representatives make sure that they are armed with true facts to back them up. He mentioned that labor representatives today are about to be students of economics—even though of a brand with which management may not always agree. These facts must not be underestimated.

Philip M. McKenna, president, Kennametal Inc., Latrobe, Pa., presented an interesting paper on the development of carbide materials and their effect on gear making, including hobbing operations. Mr. McKenna predicted that carbide may, in the not far distant future, be used as material for high speed wear-resisting pinions.

The final paper on the technical program was on cost reduction in automotive gear manufacturing by Harold J. Inch Jr., research department, Engineering Division, Ford Motor Co. Mr. Inch advocated use of pierced forgings to save material, and careful control of roughing operations so that minimum amounts of material are removed in accurate finishing. His company is saving machining time by broaching holes in pierced forgings without previous machining.

Guest speaker at the annual dinner was Leigh White, Chicago newspaperman and author, and formerly correspondent in Moscow. He said that Russia is counting heavily on a big depression in this country to hasten a revolution in America. If this depression can be prevented, plans of the Soviet will be upset and the situation will be controlled without danger of war.

New officers of AGMA for 1947-48 who took office at the close of the Hot Springs meeting are: President, Raymond B. Tripp, executive vice president of Ohio Forging & Machine Co., Cleveland; vice president, Walter L. Schneider, vice president of the Falk Corp., Milwaukee; treasurer, Fred W. Walker, vice president, Philadelphia Gear Works, Philadelphia. Newbold C. Goin was re-elected executive secretary, with headquarters in the Empire building, Pittsburgh.

ASTM Meets in Atlantic City for Week of June 16

There will be 19 sessions devoted to the presentation of more than 100 technical papers and committee reports at the 50th annual meeting of the American Society for Testing Materials, to be held in Atlantic City the week of June 16.

Society President Arthur W. Carpenter, B. F. Goodrich Co., plans in his address to take cognizance of the growth of the society and what may be ahead in the field of materials. Another speaker featured at the meeting will be Prof. Walter C. Voss, head of the department of building construction, Massachusetts Institute of Technology, who will discuss "Engineering Laminates."

RAYMOND B. TRIPP
Newly elected president, American Gear Manufacturers' Association

AMA To Hold Conference In New York June 11-12

Sessions of the special two-day conference of the American Management Association at the Waldorf-Astoria, New York, June 11-12, will concern business adjustment to industrial and social change and current business problems, officials of AMA said in announcing the conference's program.

Speaking at one conference session will be John A. Stephens, vice president in charge of industrial relations, United States Steel Corp., who will discuss the significance of his company's relations with the United Steelworkers — CIO. A. A. Stambaugh, vice president, Standard Oil Co., Cleveland, will outline price, production and cost problems.

Parker Appliance Adopts New Price Discount Policy

Introduction of a new pricing policy on its industrial lines of flared and flareless fittings for joining tubing was announced last week by Parker Appliance Co., Cleveland.

The new policy, which became effective June 1, establishes quantity discounts for the total number of items ordered, eliminating individual discounts on the products comprising each order. The same discounts are now applicable to all

vels of trade, replacing a system of different discounts to original equipment manufacturers and to the replacement market.

Explaining the new pricing structure, an W. Holmes, general sales manager, id that costs have been completely amined and the latest increases in the st of brass and copper have been figed into the new list prices and disunts. Prices under the new policy in the ggregate are lower, he added, and simplication of ordering and billing procedures ill result.

Discount policies similar to that of arker are in use by some manufacturers pipe and tube fittings but a more widepread policy in the industry is that of asing discounts on levels of trade; thus rger discounts are granted to distributrs and original equipment manufacrers, with smaller discounts allowed to uyers for maintenance purposes, regardss of the size of the orders.

Grand Jury To Investigate Car Builders' Activities

Grand jury investigation into alleged straints of trade and violations of antiust laws by "certain corporations and ndividuals in the railway car building ndustry" has been authorized by Atorney General Tom C. Clark. Subpoenas or certain documents and records of he freight car building companies, raiload and car building trade associations nd others will be issued.

"This action," said Attorney General lark, "is the result of investigation by the ederal Bureau of Investigation of comlaints that railway freight car building ompanies have entered into agreements ith each other to fix noncompetitive rices for freight cars built by them for ailroads and other purchasers, and have llocated prospective freight car manufacturing business among the various ompanies in the industry according to ercentage quotas. From that investiation it appears that four freight car uilding companies have in recent years ecured approximately 80 per cent of he freight car business."

Mild Recession Expected This Year, Survey Shows

Expectation of mild recession in business this fall was reported by a majorty of leaders in business, labor, agriculure and other fields, a summary of nswers to a questionnaire sent out by Dun & Bradstreet Inc., New York, for he Joint Committee on the Economic Report, reveals. These men do not elieve the economy is nearing a depression, however.

General Machinery and Equipment Price Movement Seen Leveling Out

Rise of only 1.3 per cent indicated in three months ended April with average for April 21 per cent above year ago. Some declines recorded this year, including diesel engines and heat-treating furnaces

LEVELING off of the upward movement in prices of general and auxiliary machinery and equipment may be indicated by the recent announcement by the Bureau of Labor Statistics that prices of this equipment rose 1.3 per cent during the three-month period from February through April, 1947.

Average prices for these products in April were almost 21 per cent above the level of a year ago.

Although overall average prices rose every month during 1946 and through April, 1947, quotations for several products remained stable or declined in 1947. Showing declines in the first four months of this year were prices on diesel engines and industrial heat-treating furnaces. Quotations remained unchanged on pumps, mechanical measuring and testing instruments, industrial oil burners and lubricating equipment.

Leading the products whose prices rose in 1947 were heat exchangers, rising approximately 12 per cent, and scientific instruments, including temperature instruments, pressure gages, flow instruments and control valves and regulators, which increased an average of 5 per cent. Less than 2 per cent increases took place in the prices of fans and blowers, power transmission equipment, cutting tools and machine tool attachments, materials handling equipment, power-type stokers, air compressors, gas welding and cutting equipment and industrial scales.

Prices of general and auxiliary machinery and equipment are now almost 26 per cent greater than in 1939.

Firm Price Policy Set Up By Westinghouse Elevator

Establishment of a firm price policy on electric elevators and electric stairways instead of pricing at the time of delivery has been announced by Westinghouse Elevator Division, Jersey City, N. J., Westinghouse Electric Corp. In announcing the new policy, Walker White, division manager, also reported price increases of up to 4 per cent.

The action firming prices was taken, Mr. White said, to provide the building industry with more stable prices and in this way eliminate some of the uncertainties confronting it and stimulate building to the projected postwar levels.

The new policy gives the building industry the stability it wants at the lowest possible price consistent with the recent wage increase of 15 cents an hour, Mr. White asserted.

Union Tool, Die Shops in Chicago Set Wage Pattern

Pay raises of 15 cents an hour, increases in minimum rates to $1.95 for tool and die and mold makers and to $1.80 for machinists, and increased vacation benefits were included in a recent contract negotiated between organized tool and die shops in the Chicago area and the International Association of Machinists—Local 113. Approximately 100 job shops and manufacturers with captive tool rooms in Chicago have contracts with the union; these 100 shops set the wage pattern generally for all tool and die shops in the area.

Terms of the contract, which is retroactive to May 1, vary somewhat among the 100 organized shops and not all the independent concerns in the district fall in line with the contract's provisions. The number of unorganized shops in the area is indicated by the statement by Tool & Die Institute, Chicago, that of its membership of 200 Chicago tool and die shops, only 27 are members of IAM—Local 113. STEEL had previously (May 26, p. 61) reported that 500 tool and die shops employing 5000 in Chicago had signed an agreement with the union.

WAA Puts $158 Million Worth of Auto Parts on Sale

Disposal by December 31, 1947, of all present inventories of surplus automotive parts, accessories and assemblies —totaling about $158 million worth in reported cost—is the goal of a new disposal procedure launched recently by War Assets Administration.

The new procedure clears the way for prompt sealed bid offerings of large inventories throughout the nation by all regions, WAA said. Regions are authorized for the first time to offer all parts except engines in their inventories at bid sales to all groups on an equal basis.

Steel Supply-Demand Balance Forecast to Purchasing Agents

Buyers warned not to expect lower steel prices this year. Sheet and strip supply expected to continue tight for some months. Capacity held adequate for postwar needs once inventories are rehabilitated

BALANCE between supply and demand for most steel products and no general change in steel prices—this was the forecast offered by David F. Austin, vice president, United States Steel Corp., to the National Association of Purchasing Agents at the 32nd annual convention of the organization at the Waldorf-Astoria, New York, June 2-4. Theme of the convention was "How Much? When? For How Much?" Three thousand buyers attended the sessions.

Mr. Austin's forecast presumes a year of full production, free of work stoppages and slowdowns, and is based on prewar standards of labor efficiency and contemplates no change in government export directives.

Asserting that steel is and will continue to be the lowest-priced basic product, Mr. Austin declared he could find no sound business reasons for lower steel prices. He said it "would be dangerous to further close the spread between present cost and selling prices and thus raise still higher the already elevated break-even point."

Present capacity is not only in excess of normal consumption but also is in excess of steel required to supply even the current demand (exclusive of that needed for rehabilitation of inventory), according to the speaker. He reminded his listeners that projected increases in sheet and strip facilities will raise capacity for production of these products by 3 million tons to more than 19 million tons annually, and estimated that within two years tin mill capacity would be increased from 4 to 5 million tons. Other expansions are under way for wire and wire products and for many others.

Robert R. Wason, chairman of the National Association of Manufacturers and president of Manning, Maxwell & Moore Inc., New York, declared President Truman's price reduction drive has been "debunked by events," and told the purchasing agents "it is futile to wait for big price cuts that cannot appear."

Speaking at the convention's steel forum, W. F. McConnor, vice president in charge of sales, National Tube Co., Pittsburgh, said it is questionable whether the outlook for sustained demand over a long postwar period would justify increased tubular capacity. The industry on a normal basis can produce about 5½ million tons a year, with a good peacetime mix. This is 48 per cent more than the 1937-40 average consumption.

L. S. Hamaker, assistant general sales manager, Republic Steel Corp., warned that buyers can expect no early relief in sheet and strip steel.

Although a number of new continuous cold mills are now under construction and on order, some of which should get into action late this year, the speaker said "it must be kept in mind that new hot mills represent the only true additions to total sheet capacity. New cold mills only divert steel from the hot-rolled to the cold-rolled category without adding anything to the overall tonnage available."

Moreover, the speaker continued: "We likewise see no early relief in the flat-rolled situation through a slackening of demand in any important industry. Republic, he said, estimates that there will be a 4,000,000-ton shortage in finished steel during the next 12 months and that about half of this shortage will be in sheets and strips.

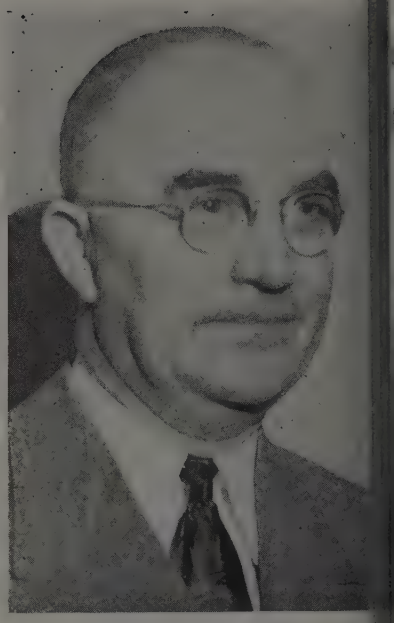
Summarizes Outlook for Steel

Summing up the outlook for some other major steel products, Mr. Hamaker said: "Some of the other forms of steel will be a little easier soon. Some already are. Stainless steel is now in ample supply. The larger sizes of cold-drawn bars are readily available. Carbon bars are becoming easier and alloy steel has not been tight.

"So far we see no letup in the demand for merchant pipe. . . .Wire products are still extremely tight as is plate, but the pressure doesn't seem to be quite so great. Tin plate demand continues at the urgency level.

"Back of all this is a huge unsatisfied export demand. We estimate that about 7¼ million tons of steel would be exported this year if the domestic situation would permit. The final figure probably will be about 4½ million tons, well below the historical percentage."

Donald J. Reese, Development and Research Division, International Nickel Co., New York, predicted that gray iron castings would be in freer supply in the next few months, while malleable castings will continue tight. He further predicted that casting prices, for the next few months, "are not likely to go down and could easily be forced upward."



GARNET T. DICKSON
New president of National Association of Purchasing Agents

Much of whatever wage patterns are agreed to, still have to be effected in these industries, he said.

Discussing steel drums, F. T. Barton president, Jones & Laughlin Steel Barrel Co., Pittsburgh, said manufacturing capacity is sufficient to meet the present increased demand. The only factor preventing this meeting of demand is the critical supply of steel sheets. In 1941 the steel drum industry consumed 654,000 tons of sheet steel, against 538,000 tons in 1940.

George W. Aljian, president of the association, and director of purchasing and packing, Californian & Hawaiian Sugar Refining Corp. Ltd., San Francisco, emphasized the importance of lower production costs to the economy of the country. Production alone does not offer the solution to the present economic impasse.

Leo Wolman, professor of economics Columbia University, New York, said that the two major maladjustments now confronting the country are: (1) Prices have advanced to a level that economy cannot sustain; and (2) much of the existing pent-up demand cannot be translated into economic demand at present cost levels. There will have to be downward adjustments in prices and probably wages, Professor Wolman stated.

Garnet T. Dickson, manager of customs and purchasing for the Goodyear Tire & Rubber Co. of Canada Ltd., New Toronto, was elected president of the association for 1947-48.

The J. Shipman Gold Medal was awarded to Roy C. Haberkern, R. J. Reynolds Tobacco Co., Winston-Salem N. C., for notable service to industry

Value of Industrial Leadership in Maintaining Peace Stressed

Speakers at annual meeting of National Industrial Conference Board, pointing out that strategy must be geared to industrial potential, urge preparedness of United States as means of preventing war. Yale & Towne president elected NICB chairman

IMPORTANCE of industrial mobilization in meeting the challenge of world leadership, a responsibility now being imposed upon this country with the possibility of grave complications ahead, was stressed in New York recently by Gen. Brehon Somervell, in charge of Army procurement during the late war, and now president, Koppers Co. Inc., Pittsburgh. The task ahead, he said, is one which leadership of industry must assume national leadership in peacetime just as it has carried on the task in two wars.

"This," General Somervell said, "involves considerations of labor, civil defense, civilian production, raw materials, facilities, transportation, communications, power, war finance, foreign trade and other aspects of the war economy which it would not be proper for the Army and Navy to administer. We must have the nucleus of civil agencies for this purpose in operation before the advent of war and not finally achieve them after years of bungling and confusion."

World Leadership Is Topic

General Somervell spoke at the 31st annual meeting of the National Industrial Conference Board at the Waldorf-Astoria Hotel, at a general dinner session devoted to "Mobilizing for World Leadership." The session was preceded by four round table conferences, held concurrently on: "Is Labor Peace Possible," "Company Practices Affecting Salesmen," "The Need for Additional Industrial Capacity," and "Dividend Policy and Problems Under Section 102, IRC."

Dr. Virgil Jordan, president of the Conference Board, in the foreword of a graphic analysis prepared for the meeting on America's resources, pointed out that the third year after World War II finds the world a virtual armed camp, and the potentials for peace difficult to appraise.

"Against this background," he said "the United States has enunciated its new foreign policy of lending monetary and military support to free peoples everywhere who oppose the imposition of communistic regimes or philosophies. Our commitments under such a program may pile up into the fatal and familiar shape of the mushroom at Bikini."

Charles M. White, president, Republic Steel Corp., Cleveland, at a round table discussion, declared that people who call for ever-increasing wages and ever-lowering of prices are either wittingly or unwittingly helping to sabotage the country.

At present, Mr. White asserted, pressure for flat-rolled steel is "terrific," adding that "we don't have all the steel we need by a whole lot." However, there is substantial expansion of sheet facilities under way, some of it already in operation and with most of it to be completed before the end of this year.

The speaker said some estimates of Washington economists as to steel capacity required over the next few years—one estimate as high as 150 million tons—fairly startled him. He admitted frankly that it was difficult to say just how much added capacity should be necessary over the next few years, but that, in his opinion, it should be nothing like the estimates now being made by some economists.

He commented on the high cost of expansion at this time, and referred to the rather poor financial showing of the steel industry over the years, with actual losses in some of them. The financing of expansion on the scale now proposed in some quarters would represent a serious problem, he declared.

As a matter of fact, Mr. White said, it is a big problem to provide for even necessary replacements. He cited the case of a battery of coke ovens at Republic which should soon be replaced. The original cost of these ovens was around $1 million; if they were to be replaced right now, the cost would be somewhere between $3½ million and $4 million.

J. Frederick Dewhurst, economist, the Twentieth Century Fund, New York, said that in the present "super-boom" period demand cannot be met overnight and that he thought it would be a mistake on the part of a basic industry, such as steel, to attempt to meet it by heavy expansion.

Sen. John W. Bricker, Ohio, attacked both the foreign and domestic policy of the administration in an address which was read by John Eckler, the senator's administrative assistant. He described the administration's foreign policy as one of "confused expediency" and, with respect to domestic policy, pleaded for "removal of the shackles that have long kept industrial leaders from effective management of their plants."

HEAD CONFERENCE BOARD

W. Gibson Carey Jr., president, Yale & Towne Mfg. Co., Stamford, Conn., was elected chairman of the National Industrial Conference Board, and Dr. Virgil Jordan was re-elected president. A. W. Robertson, chairman, Westinghouse Electric Corp., Pittsburgh, and Clarence E. Hunter, vice president, New York Trust Co., New York, were named trustees for three years.

Neal Dow Becker, president, Intertype Corp., Brooklyn, N. Y.; Arthur M. Collens, president, Phoenix Mutual Life Insurance Co., Hartford, Conn.; and Edgar M. Queeny, chairman, Monsanto Chemical Co., St. Louis, were re-elected vice chairmen. Mr. Becker was also chosen chairman of the trustees.

Rolland J. Hamilton, secretary and treasurer, American Radiator & Standard Sanitary Corp., New York, and Clyde L. Rogers were re-elected treasurer and secretary, respectively.

Coke and Coal Chemicals Institute Meets June 9-11

Technical sessions on coke, coal chemicals and gas will be among the features of the annual meeting of the American Coke & Coal Chemicals Institute at the French Lick Springs Hotel, French Lick, Ind., June 9-11.

Speakers on the subject of coke will be Hugh O. Tompkins, Fuel Merchants Association of New Jersey; Rudard A. Jones, University of Illinois; and Chester E. Shaffer, Koppers Co. Inc. To discuss coal chemicals are H. H. Tucker, Coke Oven Ammonia Research Bureau; Chester S. Edwards, Nitrogen Products Inc.; E. V. O'Neil, Donner-Hanna Coke Corp.; F. D. Schreiber, Pittsburgh Coke & Chemical Co.; and J. A. Mitchell, Interlake Chemical Corp. E. S. Pettyjohn, Institute of Gas Technology, and R. E. Kruger, Rochester Gas & Electric Corp., will speak on the subject of gas.

Maj. Gen. Alden H. Waitt, chief, Chemical Corps, U. S. Army, and Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., will address the institute at general sessions.

Cite Need of Broader Air Policy

Congress urged by aircraft and air transport spokesmen to act as concern rises for postwar aviation development, civil and military

WASHINGTON

CONCERN for postwar aviation development of the nation, in military as well as commercial types, is being manifested here, entirely apart from the effects of the series of serious air accidents that have recently occurred.

Concern ranges from charges that the postwar air mobilization plan worked out by the Army Air Forces in the late stages of the war is being ignored, to calls from air industrialists for a National Air Policy Board to recommend a long-range American air policy to Congress, for civil and military aviation.

Army procurement is based on a program of 3000 aircraft per year, for a 400,000-man air force, as recommended by an Air Co-ordinating Committee study. To sustain a minimum of 3000 planes, however, requires higher overall production.

Currently the Army has in production as its largest order, the P-84, and the P-80, new jet fighters; the B-36 bomber, and the B-50, which is an evolution of the B-29 bomber, and another bomber under wraps.

Output of Older Types Limited

About the only older-type plane now on production lines is the C-82 Packet. The Air Force also has a large number of war-model B-29's "pickled" for a later contingency, in much the same fashion that the Navy's reserve battleships are in cocoon storage.

However, Oliver P. Echols, president, Aircraft Industries Association of America, warned an aviation subcommittee of the Senate during recent hearings that the Co-ordinating Committee's recommendation of a 3000-plane minimum was practicable, "only after maintenance of world peace is well assured, and a substantial degree of disarmament has taken place."

Also, he pointed out, even this plan has not been carried out; that actual 1946 output was only 1330 aircraft, and with all types having any military potential added in, was only 1797 planes.

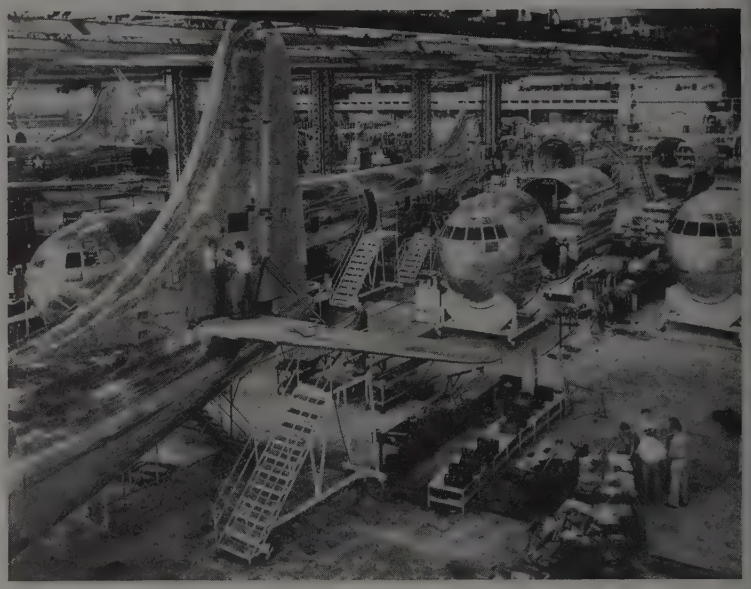
He charged further existing legislation governing aviation is largely out of date, with no comprehensive review of military-civil aviation leading to definitive action in the past 20 years. The laws then enacted included the basic Air Corps Act, Naval Air Corps Act, and Air Commerce Act, all in 1926.

Calling for up-to-date procurement legislation, Mr. Echols warned that: "It will not be possible for the armed services to have modern aircraft and flying missiles efficiently and economically under legislation dating back 20 years."

Robert E. Gross, president, Lockheed Aircraft Corp., Burbank, Calif., told the same committee that the country needs a 5-year building program for aviation. He warned, in regard to the P-80, mentioned above, that the British jet-propelled Gloster Meteor can out-speed the American fighter.

He did not say whether the comparison is based on speed tests under similar conditions; whether for instance, the P-80's speed is calculated with full combat load, as against a stripped-down Gloster.

However, Glenn L. Martin, the Baltimore, Md., aircraft manufacturer, and pioneer flyer, warned flatly that national air power is declining rapidly. National defense needs have advanced to a supertechnical stage, he continued, "which make it impractical and unrealistic, if not impossible, to carry out the government policy of a skilled peacetime military organization to be rapidly expanded in an emergency."



STRATOCRUISERS: Nearing completion on the final assembly floor of Boeing Aircraft Co.'s Seattle plant are the first of the new 340-mile-an-hour, 80-passenger Stratocruisers. Workmen are shown in foreground making final installations on the double deck luxury liner's foldable vertical tail; other big Boeings are being assembled in background. Boeing is building the big cruisers for both American and foreign air lines. NEA photo

With other manufacturers he told the Senate group that the industry is afraid of the situation created by public conceptions left from wartime production miracles. "We have over-sold the ability of American industry to work miracles," he said.

H. M. Horner, president, United Aircraft Corp., East Hartford, Conn., said in this connection that, "actually, of course, most of the aircraft facilities used in 1944 just no longer exist."

"If a 50,000 plane program were ordered today, with only production to count and money no object, we could not possibly produce more than 5000 military aircraft between now and the end of fiscal 1948," said Mr. Horner.

The agitation now extends to civilian planes also, it was brought home to Congress. Harry Woodhead, president Consolidated-Vultee Aircraft Corp., San Diego, Calif., pointed out that sale of surplus transports left from the war period has absorbed the equivalent of more than two years' production of transport planes, at the current rate.

Planes now on order will more than double existing airline capacity, he said, "so that it is pretty clear that the market for transports will shortly be saturated."

There is no market for any substantial number of planes of the C-99 type under existing limitations, he added, pointing out that three of these planes could haul all of the passengers who now ride the streamliners from Chicago

Los Angeles. One C-99, however, ill carry 400 troops, he pointed out, d the existence of a sufficient number such planes in emergency might be tal.

Meanwhile, other industrialists have ld Congress, not only has there been failure to maintain a minimum air oduction industry capable of expan- on rapidly if needed, but the contrac- on in output from the record 1944 vel (100,000 first-line planes) to the xtremely low levels currently" have rought about a financial crisis in the dustry."

Legislatively, Senate bill S. 1276 pro- ses establishment of a temporary Na- onal Air Policy Board. The bill is now nder consideration.

Apprehension and fear for the future American aviation was expressed last eek at a meeting of the Aviation Writ- rs' Association in Los Angeles.

Speaking to the writers, John C. Lee, resident, Menasco Mfg. Co., Burbank, alif., said that while West Coast air- raft builders are building better planes han ever before, they are doing so in naller quantities and at greater finan- ial losses. He said that manufacturers ho during the war developed a capac- y of 30,000 planes a year delivered nly 820 in 1946. Further retrenchment likely, he declared, unless the govern- ent adopts an air policy with at least 5-year program permitting aviation's cientists and builders to engage with onfidence in research and production.

Mr. Lee pointed out that employment n West Coast aircraft plants has dropped rom 272,000 in 1943 to 70,000 late last ear.

Similar declaration of fear for the fu- ure of military aviation was voiced by ohn Nicholas Brown, assistant secretary f the Navy for air.

Figures presented to the House ap- ropriations committee by Maj. Gen. E. M. Powers, chief of aircraft procure- ent, show the nation had dropped far elow the 3000 new military planes a ear which the air co-ordinating com- nittee deemed essential for sound peace- ime air defense. Last year the Army asked for 1700 warplanes and received funds for only 1020. However, only 681 were produced. In all, military production in 1946 amounted to only 1286 aircraft, including 114 bombers. This year's military plane production was originally estimated at 1500, but the total is expected to fall below that mark because of rising costs. For next year the Army has requested 1700 planes, but this has been cut by the budget bureau to 932 aircraft, including 152 bombers and 520 fighters. Cost increases likely will cut the number to 850, with a still further cut to 561 possible as a result of House appropriation cuts. The Navy this year received funds for 576 new aircraft, so if the House Army cut stands, American military plane production in 1948 will not exceed 1137 planes, it is said.

Many Steel Products Seen In Proper Balance in 1947

Looking ahead to the end of the current steel shortage, Bennett S. Chapple Jr., assistant vice president of sales, United States Steel Corp. of Delaware, told delegates to the annual meeting of the Liquefied Petroleum Gas Association recently that "barring unforeseen interruptions, it would appear that certainly by the end of this year, and possibly before, many products will have come into proper balance. When this happens on a large enough scale, American business will once again be operating within the fundamental principles of the law of supply and demand."

Mr. Chapple, speaking on the subject "Seeking a New Balance," at the Sherman Hotel, Chicago, reviewed the progress made by the steel industry during the war and explained the problems of the industry now. "Under normal conditions the steel industry has never failed to keep abreast of normal demand," he declared, concluding: "If you compare the demand-supply relationship of 12 months ago with the situation today I believe you will be heartened, for you will observe that we are making progress."

Decline in Pig Iron Output Is Shown for April

Furnaces engaged at 89.3 per cent of capacity against 91.8 in March. Production in year to date far above year ago

PIG IRON production declined to 4,829,717 tons in April from 5,122,857 in March and compared with 3,613,560 tons in April, 1946, according to the American Iron & Steel Institute. The industry operated at 89.3 per cent of capacity in April compared with 91.8 per cent in March and 65.2 per cent in April of last year.

Total production for the first four months of this year came to 19,589,388 tons compared with 11,829,592 in the like period a year ago, or at the respective rates of 90.6 per cent and 53.4 per cent of capacity.

Production of ferromanganese and spiegeleisen totaled 45,675 tons in April and 45,474 tons in March, making the total for the first four months 204,538 tons compared with 110,366 tons in the like 1946 period.

Output of steel ingots and steel for castings eased to 7,042,813 tons in April from 7,307,486 tons in March, according to the American Iron & Steel Institute, making the total for the first four months of this year 27,985,607 tons. The industry operated at 93.8 per cent of capacity in April, at 94.3 per cent in March and at 93.3 per cent of capacity during the first four months of this year.

Included in the total for April were 644,574 tons of alloy steel and 965,679 tons of hot-topped carbon ingots. Open-hearth furnaces accounted for 6,360,294 tons in April while electric and crucible furnaces accounted for 306,844 tons. Bessemer ingot output totaled 375,675 tons.

Blast Furnace Capacity and Production—Net Tons April, 1947

	Number of companies	Annual blast furnace capacity	Production: Pig Iron — Current month	Pig Iron — Year to date	Ferro manganese and spiegel — Current Month	Ferro manganese and spiegel — Year to date	Total — Current month	Total — Year to date	Percent of capacity — Current month	Percent of capacity — Year to date
Distribution by Districts:										
Eastern	11	12,551,280	890,924	3,615,014	25,246	101,853	916,170	3,716,867	88.7	90.0
Pittsburgh-Youngstown	16	25,042,040	1,859,123	7,628,787	9,327	58,192	1,868,450	7,686,979	90.7	93.3
Cleveland-Detroit	6	6,557,500	500,417	2,008,508	-	-	500,417	2,008,508	92.7	93.1
Chicago	7	14,097,710	1,036,706	4,133,838	-	-	1,036,706	4,133,838	89.4	89.1
Southern	8	4,924,670	319,023	1,288,983	8,764	36,625	327,787	1,325,608	80.9	81.8
Western	4	2,536,000	177,849	709,720	2,338	7,868	180,187	717,588	86.4	86.0
Total	36	65,709,200	4,784,042	19,384,850	45,675	204,538	4,829,717	19,589,388	89.3	90.6

Windows of Washington

By E. C. KREUTZBERG — Washington Editor, ST

Labor and tax bills drafted, Congress turns major attention to appropriations and federal budget for fiscal 1948. Many other pending bills will be carried over to next year, including recasting of tax structure

WITH congressional agreement reached on the 1947 labor relations bill and income tax revision, the 80th Congress has virtually completed its most important domestic legislation of particular significance to business.

However, many bills still pending are of interest to business. Some will become law this year; others will be carried over to next year.

From now on the principal business in Congress will be the passage of the various appropriation bills and the final decision on the budget for fiscal 1948. Time consumed in deciding these matters will determine how many of the other pending bills will receive consideration at this session.

Among bills pending are the following: Unification of the armed services; authorizing the railroads, under approval of the Interstate Commerce Commission, to reach rate agreements; amending the antitrust laws to cover acquisition of assets as well as stock when considering whether mergers are in violation of the law; establishing a National Science Foundation (already approved by the Senate); authorizing execution of the St. Lawrence seaway project; placing the operation of marginal and submarginal mines on a subsidy basis; inaugurating a federal stream pollution organization; setting up a technical information service for small business.

Many Projects Postponed

Other legislative projects of special interest to business definitely have been postponed till 1948. One is a revision of the wartime excise tax program so as to revise any taxes that put a damper on business and employment. Another is the shaping of a new aid program for small business under which the government would back small business loans by private financial institutions. Also to be postponed until next year are such actions as the Joint Committee on the Economic Report may recommend as a result of its present studies on how to prevent the deep postwar depression ordinarily to be expected in the 1950s.

In addition to the labor relations bill Congress enacted the portal pay bill which was signed by the President on May 15. Other acts of interest to business included: Submission for adoption by three-fourths of the states of a constitutional amendment limiting tenure in the Presidency (except in the case of Truman) to two terms; continuing most of the wartime excise taxes; authorization of rent increases up to 15 per cent; suspending the 4 cent import tax on copper until March 31, 1950; continuing the suspension of the vessel inspection statutes by the Coast Guard until April 1, 1948; extending the synthetic rubber program until March 31, 1948; reducing personal income taxes by 10½ to 30 per cent as a move to stave off business depression; and authorizing a census of manufactures.

Currently the most spectacular development in Washington is the clogging of the mails with several hundreds of thousands of dismissal notices. Beyond the fact that the number of federal employees is in the process of being reduced below 2 million, there is no definite information as to what the net effect of the Republican economy drive will be. In the first place, the federal departments and agencies send out these notices as fast as they get word of the reductions ordered by the House; they easily can rescind many of them in case the Senate, as usually is the case, gets the House to agree on restoring a substantial portion of the contemplated saving. In the second place, by sending out vast numbers of dismissal notices, department and agency heads hope to bring some extra pressure to bear.

Nobody believes that the firings are going to loom as large in the final result as the dismissal notices indicate. For example, nobody believes that all of the 74,631 notices the War Department is sending out to civilian employees will stick. It probably will not be until July before accurate information will be available as to the full effect of the economy drive on federal employment.

From the standpoint of business it is of interest to note that when the House Appropriations Committee slashed the Truman budget for the Army from $5,716,791,500 to $5,240,982,423 it did not cut the amount requested for the Army's research and development program. The committee allowed the full amount of $222,216,400 asked for such activities.

Of interest as showing House resistance to pork barrel demands was the history of the Agriculture appropriations bill in that chamber. The committee came in with recommendations for $805 million, a slash of 32 per cent from the President's quest. Despite strong farm bloc pressu the amount that finally was approved the House—and by a vote of 315 to —was $847 million.

Whether Congress will take action ease existing credit curbs remains to seen. This matter is before the Hou Banking and Currency Committee whi heard a number of business spokesm say that the Federal Reserve Board reg lation under which an installment buy has to pay at least one-third down a the rest in 15 months is undesirable. hurts people with modest incomes, s the National Automobile Dealers Asso ation. In 1941, the association stateme said, a man could buy a typical lo priced car for $311 down and $42 a mon for 18 months; now he has to put up $4 and pay $77.96 for 15 months. There at least some sentiment in Congre against encouraging long-term installme buying which might aggravate the effec of the next drop in business.

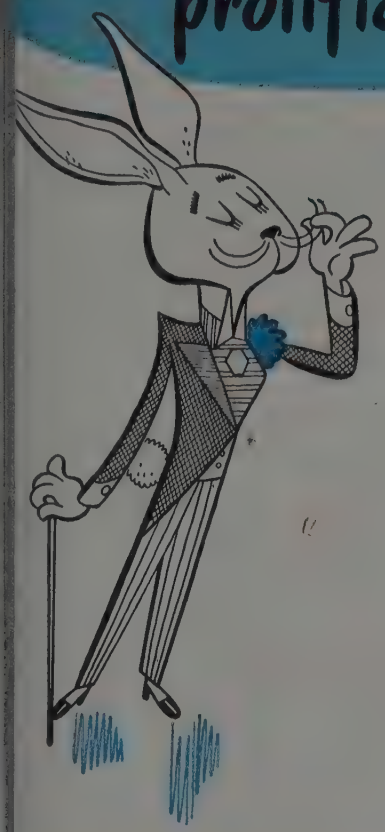
Among new developments in Washin ton is a strong campaign by the Nation Home & Property Owners Association kill off the plan by which the Nation Housing Expediter is encouraging t manufacture of prefabricated houses b agreeing to purchase all unsold unit within specified limits, at 90 per cent the market value. "Unsold prefabricate houses are piling up in warehouses as result of the government's market gua antee program," charges Joseph H. Dec man of the association's housing com mittee. "If the resistance of buyers con tinues, the government will soon ow thousands of these surplus prefab units

Billion and Half for Roads

Demand for steel and machinery fo highway construction purposes will b of record proportions for a decade t come, according to Public Roads Ad ministration spokesmen. Undisturbed b the Republican economy drive, the Pub lic Roads Administration is sitting pret with an authorization to spend $150 million at the rate of $500 million an nually for three years.

This program covers the federal gov ernment's aid to the states for use i highway construction. It has been in th limelight recently as a result of Hous approval of H. R. 1874 which now i on the Senate calendar for early favor able action. This bill gives the Publi Roads Administration and the 48 state an extra year to spend the funds to mak up for the delays last year and this yea

prolific perfectionist



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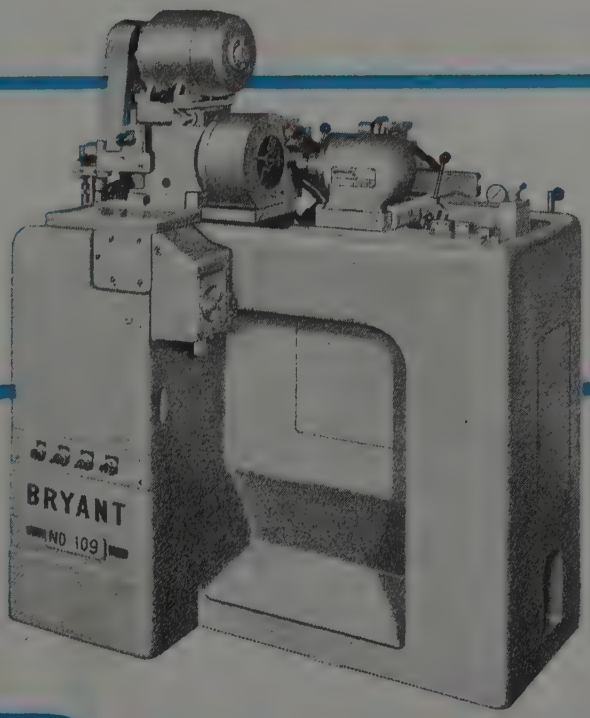

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ASKS SEAWAY APPROVAL: Secretary of State George C. Marshall, left, testifies before Senate Foreign Relations Subcommittee in favor of the St. Lawrence Seaway project to provide a submarine-free deep water channel from the Atlantic to the Great Lakes. At right is former President Herbert Hoover, who also urged congressional approval of the project. NEA photo

due to scarcities of labor, engineers, steel and other materials, equipment, and to the desire of public officials to wait until later in the hope that they again soon will be able to get more value for a highway construction dollar.

Under H. R. 1874, the Public Roads Administration will have until June 30, 1950, instead of June 30, 1949, to farm out the remaining unobligated $800 million. That extra year will be needed, says a spokesman, for the PRA is going to hold back a large part of the contemplated work until prices go lower. This policy is reflected in the following statistics:

1—Contracts let by state highway departments in calendar 1946 came to $748 million which included federal aid of $229 million.

2—Contracts placed by state highway departments from Jan. 1 to April 30, 1947, came to $237 million which included federal aid of $66 million.

3—Federal aid obligations on Apr. 30, 1947, on projects approved or in a more advanced stage, but not yet placed under contract, came to $394 million. These obligations applied to highway projects involving $800 million altogether, and covering 21,964 miles of road including 3331 bridges.

4—Highway projects completed or underway by the states, on Apr. 30, 1947, under the supervision of the PRA, involved 52,154 miles of road and a total outlay of more than $3 billion; all of this contemplated business remains to be qualified for federal aid.

The Public Roads Administration does not keep records of the requirements involved in the highway construction program; these are kept by the highway departments of the 48 states. But PRA engineers say that in a general way the steel requirements will be enormous. In the first place the 5-year wartime recess must be made up. In the second place the highway of the future will use much more steel.

The PRA is about to select some 40,000 miles of important trunk highways in various parts of the country for improvement to very high standards. They will be 4-lane express highways going through the nation's large cities. Shoulders will be full width and, instead of stopping at bridges as now is usual, the shoulders will continue uninterruptedly across new bridges. They will be free of grade crossings and big tonnages of steel will be required for ramps, culverts, tunnels and overhead crossings. This program will be the PRA's first drive against today's loss of valuable time and the waste of millions of dollars worth of gasoline that are consumed by motors idling in front of red traffic lights.

In addition, the PRA now is working on an enlargement of the original federal aid program. Originally it applied to some 232,000 miles of state highways, including extension of these highways through cities. Now this prog is to have superimposed on it an inc nite mileage of secondary roads q fying as farm-to-market highways. L on, it is expected, further developm will be announced.

Roughly, the PRA estimates that proximately 50 million cars and tr will be on the highways by 196 compared with the peak 32 mill of 1941. That is the goal which it in mind—of providing a highway tem that can be traversed safely that will serve all parts of the cou

In carrying out this program, the P will work with this economic philoso in mind: In times of inflation and sc ities such as the present it will tend hold down highway construction. times of poor business and wide un ployment, to materialize perhaps so time in the fairly near future, it step up the tempo of highway w Not only should such a policy help country's economy, but it will result getting more value for the taxpay dollars.

There will be exceptions, of cou where the pressure of traffic and sa call for quick action. For example, PRA is going along with the states the District of Columbia on a num of 4-lane bridges which are badly ne ed. Those in line for quick action as follows: Bridges across the Mississi at Memphis, Tenn., across the Poto at Washington, across the Anacostia Washington, across Yorktown bay Virginia, across the Delaware in D ware, across Tacoma Narrows at coma, Wash., across Lake Charles, Louisiana, and a new bridge across Francisco bay.

Housing Restrictions Modified

Only two direct allocations of b materials remain in the housing progr in which several restrictions have b modified. Pig iron contines to be a cated to producers of cast iron soil p and shop-grade lumber to millwork ma facturers.

The housing expediter also spons three voluntary allocation plans, cove steel for housing items, pig iron to p ducers of housing items other than pipe, and phenolic resin molding c pounds for manufacture of electrical v ing devices.

In liberalizing restrictions on housi Expediter Frank R. Creedon announ that federal housing permits no lon will be required by those who want build a house for themselves or for v erans, the limit on the number of ba room fixtures is removed, and the 1 sq ft limitation is lifted to 2000 sq Other controls generally are continued

rance Receives Larger Shipments Of Coal from Ruhr, United States

Wave of strikes by workers demanding higher wages and improved food supply threatens French recovery but is overcome as government permits limited increases in form of production bonuses. Opel factory again in production

PARIS

FRANCE is receiving 388,000 tons coal from the Ruhr in May and June, well as some 70,000 additional tons compensate for the difference beeen allocations and actual deliveries m January to April. This is to be ded to 1,500.000 of coal expected m the United States for May and ne.

Comparison between allocations and ual deliveries from the Ruhr from uary to April is as follows:

	Allocations (Metric Tons)	Deliveries (Metric Tons)
uary	108,000	63,000
ruary	102,000	43,588
rch	140,000	137,000
ril	140,000	182,000
al	490,000	425,588

locations of American coal have fallen ort of deliveries, the comparison being follows:

uary	466,000	448,000
ruary	490,000	416,000
rch	592,000	572,000
ril	787,500	640,000
y	787,500	.....
ne	787,500	.....
tal (4 mos.)	2,335,500	2,076,000

It is learned from Germany that the pel automobile factory has started erations again, and is preparing to exrt, spare parts being made available r cars and trucks in foreign markets. his should help Germany to pay for r food imports which, in itself, will lp to intensify coal production.

Several new strikes and extensions of isting ones have spread in France's dustrial areas. The cause of these rikes is a demand for higher wages nd an improved food supply. The ovement in the metallurgical industies began at the Renault government-ntrolled automobile works near Paris; is spread to several minor concerns in ris and its suburbs. River and canal affic was also held up in northeastern rance and extended to the waterways f the northwest. There were also oppages in the nationalized coal mines the north. A 24-hour token strike ok place in the industrial town of lonlucon on orders from the local nions affiliated with the general labor deration. Apart from these industrial rikes, the most serious outbreak was in ne flour mills, and if this strike had lasted a few days longer than it did, France's bread supply would have been seriously menaced.

At the time of writing, this strike movement has practically come to an end, and this has created a renewed feeling of optimism since the government has proved itself capable of weathering the storm. The government has given way to some extent on its stabilized wages policy by permitting limited increases under the guise of production bonuses and, for the time being at any rate, labor is again co-operating.

Production of pig iron and ferroalloys in France during the first quarter of this year was 1,170,000 metric tons, as compared with 597,000 tons in the first quarter of 1946. For steel ingots and castings the figures were 1,433,000 tons and 792,000 tons respectively, and for hot-rolled products, including tin plate and galvanized sheets, 1,084,000 tons were produced in the first quarter of this year, as compared with 598,000 tons for the first quarter of 1946.

Exports of iron and steel products from France in the first quarter of this year was 44,600 metric tons, while imports totaled 135,000 tons. In 1938 the monthly average of exports was 128,000 tons and the average monthly imports were 6000 tons.

British Conservative Party Issues Statement Of Policy in Its "Industrial Charter"

LONDON

A STATEMENT of industrial policy has been issued by the British Conservative party under the heading, "The Industrial Charter." The Conservatives state their objective is to free industry from unnecessary controls and restrictions, and to substitute for the present system a system of free enterprise which shall reconcile the need for central direction with the encouragement of individual effort.

In treating the present crisis, the statement sets forth the need for definite priorities in the following order:

1. Coal and Power: Coal production goal should be not less than 220 million tons.

2. Transport: Railroads and shipping should have a priority second only to power.

3. Capital Equipment and Housing: Within this field there must be a clear order of priority which provides first the machinery for basic industries, secondly, plant for export industries and essential consumers goods, and thirdly, machinery for export. Parallel to the provision of machinery comes the construction of houses.

4. Food and Agriculture: A powerful drive to increase the output of British farms and gardens must be undertaken.

In defining the relationship between government and industry, the Conservative statement stresses there should be strong central guidance under which there would be co-operation in making plans and competitive enterprise in carrying out those plans. One minister would be charged with surveying national resources and would seek for the government advice of industry and workers.

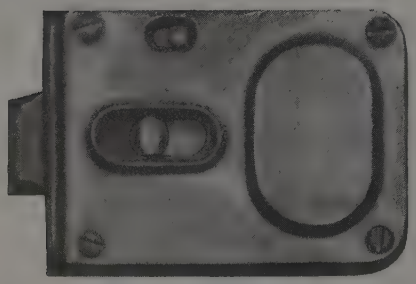
The statement says the government must be responsible for maintaining a high and stable level of employment through stimulating activity in those industries most liable to fluctuations.

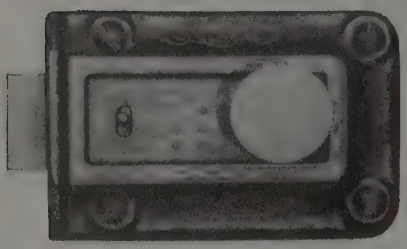
Government expenditure must be reduced and relief from taxation given to earned income at all levels.

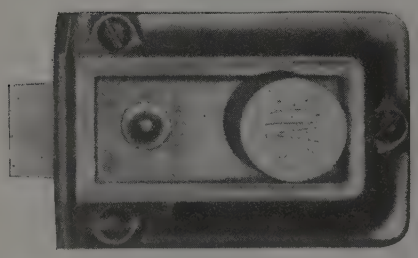
Exports should be four times the value of prewar exports. Products should be sold by industry, but the government should assist by market research and export guarantees. The principle of Commonwealth preferences, especially colonial preferences, should be preserved.

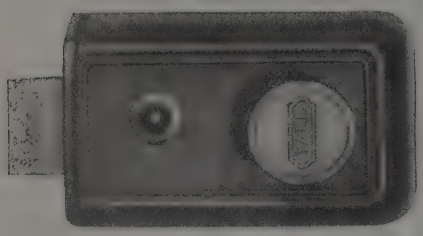
Nationalization of industry is opposed in principle, but the Conservatives do not believe it will be desirable to restore to private ownership the coal industry and the Bank of England. The party firmly opposes nationalization of the iron and steel industry.

An important section of the statement is devoted to proposed measures to give the workers security of employment, incentive and status. The Conservatives will propose legislation requiring that every worker be given a statement of the terms on which he is engaged, relating the period of notice to length of service, and encouraging extra reward for extra effort and initiative. A comprehensive system of education and training in industry is urged, with recognition of the need for special training for supervisory grades and for management.









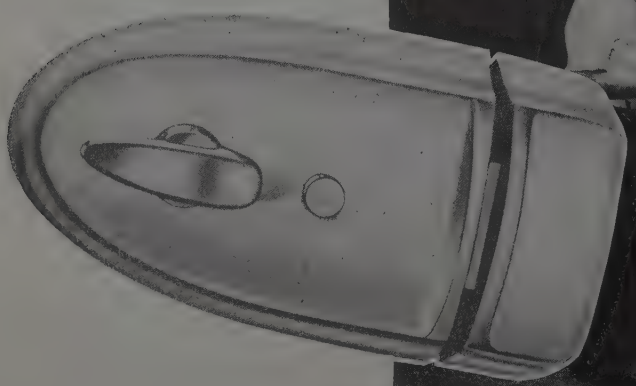
Builders' Hardware Go

TO MEET unprecedented demand, yet to reach peak level, the builders' hardware industry is going into mass production, concentrating on volume and a reduced number of more standardized products. Many of the new catalogs reflect this trend; they are leaner.

Few branches of metalworking are undergoing as many progressive production changes, involving improved practice in stamping, forging, casting, automatic screw machine work, finishing and specialty die-casting of zinc-base alloys. All of this is radically influencing design in some or most products and is accompanied by improved labeling, packaging, distribution and market-study planning, for the return of normal markets.

Demand for builders' hardware will be brisk for several years, some estim at least five, with the peak coming 1948 or 1949 with a $110 million volu Because of current high building co dips and curves in requirements may expected until this situation is remed to a more economic level; indeed, t is already in evidence, but the short of housing and commercial building sp which eventually must be overcome dicates the peak is ahead.

Strictly speaking, builders' hardwa is part of the building industry. Th were 37 plants producing this t hardware in 1946 to the tune of ab $100 million, a 60 per cent increase o 1945 dollar volume. Physical product was approximately 25 per cent high yet this increased output fell short meeting requirements by 25 per ce



o Mass Production

Fifty-seven plants producing metal accessories for buildings will consume 95,000 tons of rolled steel in 1947. Output may exceed $100 million in value

By L. E. BROWNE
Associate Editor, STEEL

rdware is used largely at the end of ilding cycles and the increased rate completion on projects started earlier placing heavy demands on manufacers. Shortages of hardware for build- has been minimized by some delays completion.

Just where the line of separation rks builders' and some general hardre or related accessories is broadly ject to individual interpretation, but ything in equipment or metal parts ed in the operation of a door or ndow, accessories and components inuded, is safely in the category of ilders' hardware. This includes locks, ys, latches, hinges, butts, knobs, doorsers and stops, hasps, some types of m, spring hinges, sash pulleys and llances, to mention a few. Miscellanus additions to this general classifiion include shelf and cabinet hardre, clothes hooks, certain bathroom d other trim and fixtures, some of hich may closely approximate the mbing supplies or electrical fixture tegories.

Of the 57 plants producing these oducts, some make only one or two; s than 10 manufacture what covers complete or general line and these count for around 80-90 per cent the total production. As a consumer steel the industry is a volume and diversified customer. Of brass and bronze, builders' hardware accounts for a large volume, and the ratio is growing. The same is true of zinc-base alloys and aluminum.

This year 95,000 tons of rolled steel will be fabricated into hardware, with strip the leading steel product, but broken down approximately as follows: Hot-rolled strip, 19,655 tons; cold-rolled strip, 35,050 tons; hot-rolled sheets, 13,460 tons; cold-rolled sheets, 3000 tons; coated sheets, 3260 tons; wire, 7765 tons; hot-rolled bars, 6820 tons; and cold-finished bars, 3280 tons. By far bulk of this tonnage is in carbon steel grades, relatively little alloy steel being used. But the fact most of steel tonnage is flat-rolled has made more difficult the problem of supply thus far in the reconversion period. Requirements of brass and bronze, both wrought and cast, is increasing with aluminum edging in.

With the trend toward mass, streamline production among most volume manufacturers come numerous developments in design and utility. Most producers are working on something new to appear in the near future or already have brought out new goods. One due shortly includes radical improvements in a door closer involving new basic principles of operation. Several are developing new designs and improved operation in lightweight resident unit locks; one is cast and a second is largely a stamping.

Designs stress simplification with a minimum of or no ginger-bread lines. Electronic operation and more general standardization of hollow metal doors in heavy construction is influencing hardware lines to considerable degree. New machinery and equipment, including infra-red finishing, is getting into production at most shops.

Probably some of the most outstanding advances are being made in die-casting with a strong influence on design, elimination of much machining and development of improved practice in surface finishing; stamping and press operations involving better die practice is quite general.

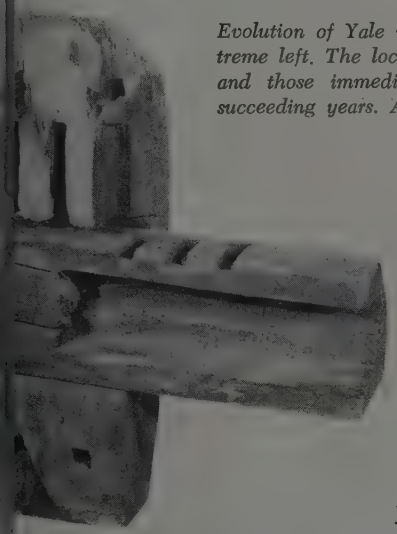
Yale & Towne Mfg. Co., Stamford, Conn., is die-casting a new night latch and stamping escutcheon plates complete from blanks in eight operations on one press whereas formerly this plate was produced on three to four machines. Design of this latch more than doubles throw of the bolt and the unit is interchangeable with door hinge or swing. This is Yale's new one-arm spring latch. At this Connecticut plant and, incidentally, the nutmeg state is a leader in production of builders' hardware, enameling facilities have been increased 200 per cent; an infra-red system was built around former equipment and baking time is reduced from 4 to 2 hours. In some plants finishing now accounts for about 15 per cent of production facilities.

Better plating on die-cast surfaces is general, while operation of escutcheon plate presses is largely automatic, greatly increasing output involving stamping, drawing, drilling and tapping. Labor cost is high, at least 75 per cent for some products, and labor rates have nearly doubled in five years. The average price increase for finished hardware has been about 34 per cent during that period while at the same time the product has been materially improved. High material costs figure in this increase, of course.

Hardware for building falls largely into two classifications, light and heavy construction. Because of strong demand for housing, most plants are concentrating heavily on lighter assemblies with fewer items in production. Good marketing is necessary for support of mass production and in this connection, distribution methods are improving with better labeling and packaging.

Relatively more hardware is required for private dwellings and housing projects than for office and commercial buildings. Frequently some large in-

(*Please turn to Page* 152)

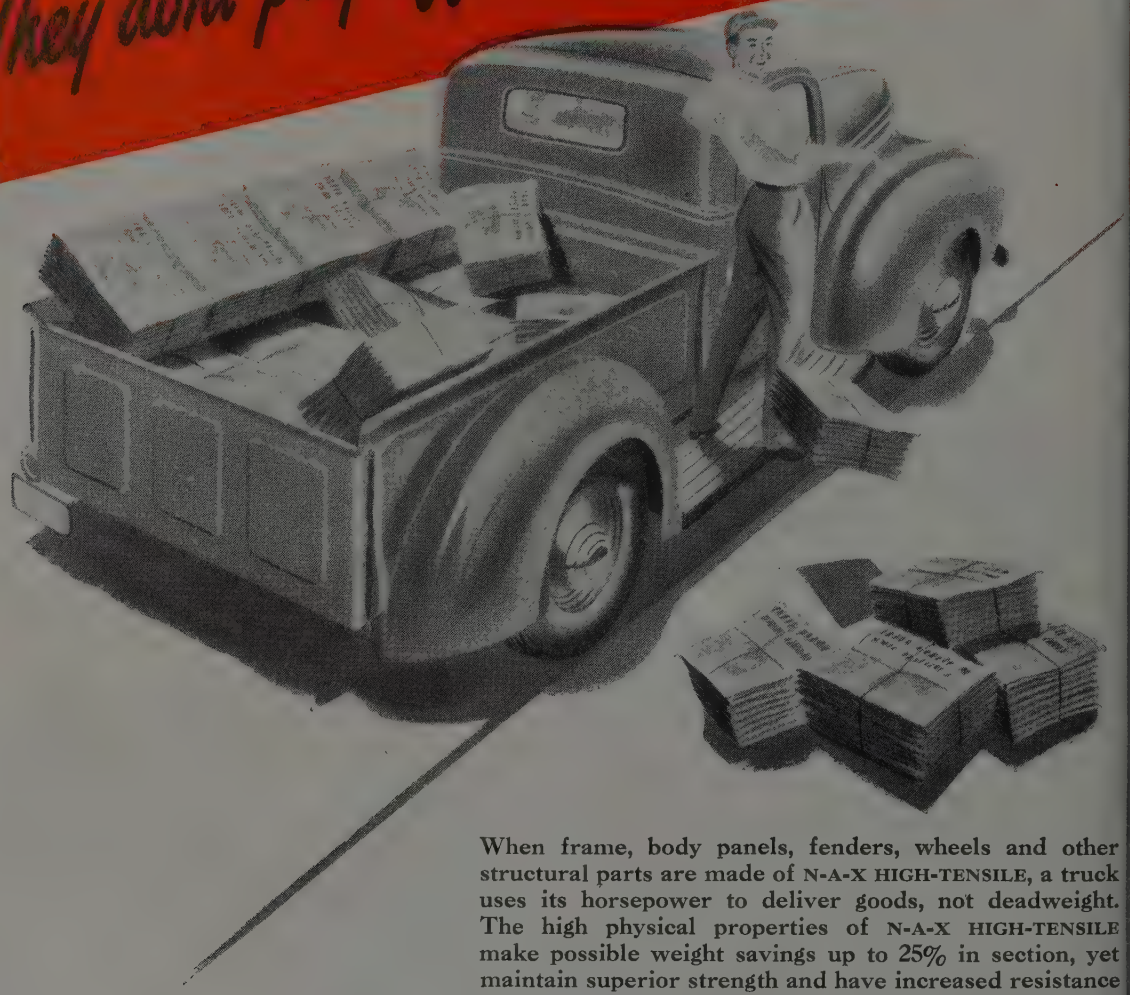


Evolution of Yale night latches is shown in photos at extreme left. The lock shown at top was developed in 1867 *and those immediately below are refinements made in succeeding years. At bottom is shown Yale's new one-arm spring latch*

Eight operations are performed on press, middle left, in producing an escutcheon plate. The press performs work formerly requiring four machines. Operations include stamping, drilling, drawing and tapping

Oldest lock known is the Egyptian type, immediate left. Photos by Yale & Towne Mfg. Co., Stamford, Conn.

They don't pay off on DEADWEIGHT



When frame, body panels, fenders, wheels and other structural parts are made of N-A-X HIGH-TENSILE, a truck uses its horsepower to deliver goods, not deadweight. The high physical properties of N-A-X HIGH-TENSILE make possible weight savings up to 25% in section, yet maintain superior strength and have increased resistance to fatigue, corrosion, abrasion and denting.

On the job, the savings in pounds mean a savings in dollars. Gasoline economy is improved. Maintenance costs are reduced. Life factor is increased.

If you make a product that moves, it will move more efficiently and economically through the application of N-A-X HIGH-TENSILE. Good formability, excellent weldability and fine surface texture for finishing make N-A-X HIGH-TENSILE a great steel to work with, too.

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HIGH-TENSILE STEEL

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UNIT OF NATIONAL STEEL CORPORATION

A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

"Boss" Kettering, retiring as General Motors research chief, reveals development of high compression gasoline engine which will permit 33 per cent increase in fuel economy. Will require high octane gasoline

DETROIT

ALTHOUGH characterized as "just progress report" of work done by neral Motors Research Laboratories r the past 30 years, most engineers eed the paper delivered by Charles Kettering, head of these laboratories, ore the Society of Automotive Engirs at French Lick, Ind., last week a text of considerably greater stature, that it blueprinted rather clearly the h of automotive engine development r the next few years. Briefly, what in store is a progressive change, ticularly in structural design of power nts, which will permit a gradual inase in compression ratio from the sent 6.5 to 1 to an eventual 12.5 1, permitting an increase in gasoline nomy of 33 per cent with equivalent better performance.

It was in a sense a valedictory message m the GM research dean, who has ched retirement age and will be sucded by C. L. McCuen, vice presint in charge of the engineering staff. M. Crawford, for a long time chief gineer for Chevrolet and latterly istant to McCuen, becomes heir to gineering direction. "Boss Ket" will ntinue as a director and research contant. John Thomas Smith, vice presnt and general counsel for the corration, also has retired, being sucded by Henry M. Hogan.

Fuel Economy Results

Over the past three decades changes l improvements in engines and fuels ve brought a one-third improvement fuel economy, Kettering observed in discussion. Compression ratios have en upped from 4 to 1 to 6.5 to 1. soline octane ratings have been raised around 80; engine speeds have been ubled and power output increased two three times. Contributing importantly the advance, of course, was the roduction of tetraethyl lead to gaso-e, a technique pioneered by GM rerch, working in co-operation with the troleum industry.

From their work with diesel engines, which compression ratios run up as gh as 17 to 1, GM technicians recogzed the key importance of this factor. owever, for spark ignition engines, els and power plants have not yet en matched properly to permit any ch increase in compression ratios and

CHARLES F. KETTERING

a possible boost in brake thermal efficiency from the present 20-25 per cent to the diesel's 40 per cent. Developments in fuels, such as triptane, have made such increases possible experimentally but their cost is far out of line as yet from a commercial standpoint. Use of triptane fuel in experimental engines has disclosed some of the mechanical problems involved in designing automotive engines for high compression ratio, and hence has been an invaluable research tool. GM pilot triptane plant in Detroit has turned out thousands of gallons of the amazing new fuel (rated the equivalent of 500-octane) at a cost now reportedly in the vicinity of $1 per gallon or less.

With plenty of knockless triptane available, Kettering and his associates following the end of the war built up a single-cylinder test engine of 30 cubic inches displacement to explore compression ratios up to 15 to 1, in five steps, effected by changes in pistons. Results showed most of the gains of high compression ratio were realized at about 12.5 to 1. With these data, combined with a considerable store of knowledge on diesel engines, engineers decided to build a 6-cylinder overhead valve engine, with compression ratio of 12.5 to 1, which could be installed in a car and road tested. For comparison purposes a standard 1946 production car with 6-cylinder engine was selected, and the new test unit designed to conform as closely as possible with it, as far as horsepower, axle ratio and weight were concerned.

Tests Show Improved Performance

After the first 6-cylinder high-compression engine was built and tested, a second unit was built for installation in a test car. Design was conventional except that additional rigidity was provided to carry the higher loads involved. Weight proved to be no more per horsepower than that of stock engines. Careful tests of the new engine under varying conditions of speed showed improvement in economy of 30-35 per cent, accompanied by no more friction or roughness than was shown by the stock engine. Fuel used was not triptane, but a so-called sensitive type of gasoline produced by catalytic cracking and the addition of tetraethyl lead to yield a research octane rating of 99—a fuel which could be produced and sold in large quantities at a comparatively small premium.

Assuming a premium fuel of this type were available commercially, designers of new engines to use them would have to keep in mind two important points—pressures and temperatures. Peak firing pressures would jump from the present 580 psi range to around 1150 psi, calling for modifications in crankshafts, connecting rods, pistons, and particularly bearings. Temperature factors to be considered include temperatures of

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	442,242	140,738
April	449,228°	248,108
May	392,100°	247,620
June		216,637
July		331,000
August		359,111
September		342,969
October		410,510
November		380,664
December		380,908
12 mos.		3,268,456

° Preliminary.

Estimates for week ended:

May 17	83,201	48,565
May 24	96,651	53,020
May 31	77,843	33,895
June 7	85,600	45,043

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ROUGE POWERHOUSE. Force that moves the wheels of the Ford Motor Co.'s Rouge plant at Dearborn, Mich., comes from this powerhouse. The four turbo-generators in the unit are capable of supplying 345,000 kw per hour

valves, pistons, combustion chambers, inlet air, as well as valve timing and spark advance.

It is patently impossible for the automobile industry to retool in a single year to take full advantage of the high-compression engine which Kettering and his researchers have been testing. They are the first to admit it, along with the impossibility of the oil industry shifting overnight to volume production of the necessary high-octane fuel. However, it may be possible to work out basic engine designs which would permit successive increases in compression ratio in succeeding models, more or less in step with increases effected in octane ratings of gasolines.

One thing seems pretty sure: It will not take another 30 years to realize the next 33 per cent improvement in fuel economy of automobile engines. The cycle of development in both engines and fuels is accelerating notably, thanks to the tireless efforts of industry's research experts.

Retirement of "Boss Ket" ended a 27-year active association with General Motors, which acquired his research laboratories in Dayton in 1920. Before joining GM, Mr. Kettering already had won widespread recognition as inventor of the automobile self starter, the electric cash register and the Delco system of farm lighting.

Since then he has made major contributions in the development of the two-cycle diesel engine, tetraethyl lead, the freon refrigerant and the new engine.

His work in the field of medical research also has been recognized, but less publicized.

Mr. Kettering is reported to have an investment of $33 million in General Motors.

Jeep Exports High

Willys-Overland discloses in the past 15 months it has exported 27,586 jeeps and jeep station wagons with a total valuation of $32 million. Forecasts call for 40,000 units to be exported this year. Of the total shipped thus far, 10,687 or nearly 40 per cent were shipped during the first quarter of this year. The 15-month total represents about 25 per cent of the company's overall production.

In Latin America, principal export market for jeeps, about 7500 units with a valuation of $10 million have been sold. The company has 130 foreign distributors and more than 1000 dealers in 87 nations and colonies. About 80 per cent of the jeeps exported are being used in agriculture. As they leave the Toledo plant, the vehicles are knocked down and packed securely in wood crates, then loaded by monorail crane into gondola cars, 12 to a car. A large force is engaged in packing and crating export shipments, and an average of eight cars a day moves out of the siding along the loading dock.

New Plating Installation

Claimed to be one of the largest automatic electroplating installations in the world, the new copper-nickel-chrome plating installation at Pontiac is now in operation. Parts are handled through the various cleaning, plating and wash tanks entirely by overhead conveyor, with elaborate systems handling the supply of solution to plating tanks and removal of fumes. One nickel solution tank alone holds some 67,000 gallons.

Pontiac also has completed moving operations into a new axle plant and to the new motor assembly line, with no interruption to final assemblies. Transfer machines to the new motor line was a difficult feat because of the size of some of the units which had to be dismantled, moved and reassembled in the new location.

Foundry Expanded

Foundry expansion at the Pontiac plant is proceeding steadily although more slowly than original schedules had anticipated. Two new 108-inch cupolas should be in operation shortly, whereupon the four present cupolas will be closed down and rebuilt to 102-in. diameter. New sand distributing system is in operation.

Premium Shipments Costly

Estimates on the cost of premium shipment of materials and parts to Ford assembly lines show a total of $10,000 daily. Air express, air freight and rail express all share in the race to get supplies to lines to avoid shutdowns. Total transportation costs for the Rouge plant and all assembly plants run to around $6 million monthly, an expenditure which never would be countenanced in normal times when sufficient floats are built up to permit regular movement of freight. The company maintains a chartered airplane which speeds materials daily from Dearborn to Edgewater, N. J., returning with general merchandise.

Peak Civilian Truck Output

First issue of *Motor Truck Facts* since the end of the war, and the seventh edition since it first was published in 1927, is off the press and discloses 1946 output of 938,263 civilian trucks, eclipsing all previous records by a wide margin. But of these were in the light and medium classifications, only 67,973 being classified as heavy types, or with gross vehicle weight over 16,000 pounds.

Other features of the 1947 edition prepared by the Automobile Manufacturers Association, include data on truck registrations, production and registration of motor coaches and busses, average age of trucks in use, world registrations, types and quantities of materials hauled by trucks, taxes paid by truck operators, state limitations on vehicle sizes, etc.

a Significant *Announcement...*

2 NEW

TIME AND MONEY SAVING

MURCHEY

TANGENT CHASER DIE HEADS

Chasers and chaser holding blocks quickly replaced without losing size adjustment

The NEW MURCHEY "TRB" Rotating or the "TLB" Stationary Die Head, with extra chasers and blocks preset to exact location in the Murchey fixture, *takes the place of two or more complete tools.*

Down time is reduced to a minimum—replacement of chasers and holding blocks is usually made *without removing tool from the machine.*

Chasers of a given pitch may be used to cut any diameter thread within capacity of the head.

No special equipment is required for close-to-the shoulder threading.

Longer chaser life is assured. Chasers are merely cleaned up on cutting edge—do not have to be ground to a predetermined point when sharpened.

A joint statement
by *SHEFFIELD* and *MURCHEY:*

Present and prospective users of Murchey products are assured of

CONTINUED
product and sales service of the Murchey line of products

AVAILABILITY
of Murchey replacement parts

PROMPT SHIPMENT
of Murchey tools and chasers

FURTHER DEVELOPMENT
of Murchey products through research.

Contact your nearest MURCHEY REPRESENTATIVE on your current threading problems and ask for copy of new MURCHEY catalog—or write direct.

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2698

Auto Industry Expanding on Pacific Coast

Fourteen makes of cars now assembled in West. Major companies expanding present facilities and adding new ones

SAN FRANCISCO

PROSPECTIVE large increases in production by auto assembly plants in California promise expanding business for West Coast metal fabricating companies.

The major auto companies are adding new facilities to assembly plants in this state and are building new factories. Wartime increases in California's population has widened the auto market here.

When present expansion programs are completed, 14 different makes of cars will be assembled on the coast. It is expected that production will be at least four times greater than before the war. For example, it is estimated that annual production of autos in the Los Angeles area will rise to 650,000 units from the prewar total of about 150,000.

Larger production is being planned, too, in the San Francisco area where General Motors operates three plants and Ford has its West Coast headquarters plant.

Number of Suppliers Increases

The number of western factories supplying parts and materials for western-assembled cars is growing daily. Ford alone expects to buy an ultimate $90 million of parts and materials annually in the far west. The company has contacted some 2000 firms, and expects to sign up some 500 initially, following up later on contracts with several hundred more.

General Motors' purchases also are expected to run into millions of dollars. At present, General Motors is purchasing about $40 million of supplies each year in California, about equally divided between its San Francisco and Los Angeles assembly plants. Another $20 million of orders annually will be placed from its new assembly plant in southern California, now under construction.

Many of these parts suppliers are long-established companies which have supplied the automakers for a number of years. But there also are many orders being placed with war-born companies, or firms which had never attempted to manufacture auto components.

In addition, the auto firms are drawing on manufactures built up during the war by entirely new processes. For example, synthetic rubber plants in Los Angeles have expanded that area's tire production to a level second only to Akron. The auto companies now are buying many of their tires from Los Angeles plants.

Among other components being manufactured on the West Coast are springs and bumpers, seat pads, coverings and seat springs, paints and varnishes, wheels, and forgings and castings.

OPEN HOUSE: Almost 4000 guests visited the Los Angeles plant of the Joseph T. Ryerson & Son Inc. at a recent open house

Westinghouse Output Sets Peacetime Record in April

Peacetime record of $58,485,244 worth of products was turned out by Westinghouse Electric Corp., Pittsburgh, during April, according to Gwilym A. Price, president. This was $8 million larger than the previous high peacetime month of March, 1947, and compared favorably with many wartime months, Mr. Price disclosed.

Despite the high production, new business booked in April greatly exceeded output with the result unfilled orders reached a new peacetime peak, amounting to $673,381,438. Employment, too, reached a new high with 99,863 persons on the payroll, an increase of 2373 over March. This compares with peak wartime employment of approximately 115,000.

Gains in production were spread generally throughout the company's divisions, with the greatest increase made by the Electric Appliance and Transformer Divisions. Westinghouse has scheduled for delivery this year almost twice as many kilowatts of turbogenerator capacity as the company ever turned out before in a single year.

Dresser Gets Soviet Order For Oil and Gas Equipment

Dresser Industries Inc., Cleveland, has received orders from the Russian government for eight deep-drilling rigs, 26 portable drilling rigs, 10 portable clean-out rigs, over 100 pumping units, a liquid methane plant and various other equipment, J. B. O'Connor, the company's executive vice president, recently announced on his return from Moscow where he negotiated the sale.

The equipment will be used in a current five-year plan to rehabilitate and develop Russia's petroleum and gas fields, he said. Explaining that the "program embraces plans for the entire nation," he asserted "it is much larger in its potentialities than would be a similar program conducted by any one company in the United States."

The deep-drilling rigs, to be manufactured by International Derrick & Equipment, a Dresser member company, will be capable of drilling to 15,000 ft and will use the type bits designed for deep drilling in the Rockies. They will be used in the fields between the Volga and the Urals in the Kuibysheve district, Mr. O'Connor said.

The portable and clean-out units and the pumping equipment will be used to rehabilitate the Maikop field, which suffered wide damage during the war. The liquid methane plant will be used in connection with a natural gas pipe line between Saratov and Moscow.

BRIEFS . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Clearing Machine Corp., Chicago, manufacturer of mechanical and hydraulic presses, has purchased Jackson Hydraulic Machine Co. Inc., Rockford, Ill., which will be operated as a division of Clearing Machine Corp. The Rockford plant will be used as a laboratory and for the manufacture of parts for Clearing presses. Paul Jackson, president of the Rockford firm, becomes vice president and member of the board of directors of the Clearing organization.

—o—

Adel Precision Products Corp., Burbank, Calif., manufacturer of hydraulic equipment, has moved its East Coast office to 77 Bedford St., Stamford, Conn., with J. P. Barker in charge.

—o—

General Electric Co., Schenectady, N. Y., has opened a new resin manufacturing plant at Anaheim, Calif., which was designed and built by Chemical Plants Division of Blaw-Knox Co. The alkyd resins to be manufactured at Anaheim are basic ingredients for paints, enamels and other surface finishings.

—o—

Chesapeake & Ohio Railway, Cleveland, surpassed all its existing coal loading records with the loading of 5745 cars on May 28. This compared with a previous high of 5736 loaded last Apr. 24.

—o—

Tennessee Products Corp., Nashville, Tenn., manufacturer of coal tar and wood distillation products, has changed its corporate name to Tennessee Products & Chemical Corp.

—o—

Chance Vought Aircraft, East Hartford, Conn., division of United Aircraft Corp., will stage an air show and aircraft exposition June 21 at Stratford, Conn., in observance of its 30th anniversary.

—o—

American Brass Co., Waterbury, Conn., will close all manufacturing departments and all branches June 29 to July 12 for vacations.

—o—

D. J. Murray Mfg. Co., Wausau, Wis., manufacturer of paper mill machinery, iron and nonferrous castings and unit heaters, has moved its Chicago office to First National Bank Bldg., 38 S. Dearborn St., with O. J. Malina in charge.

—o—

Leslie Co., Lyndhurst, N. J., manufacturer of pressure and temperature regulators and controllers, strainers and whistles, has appointed Sherwood Bishop Co., Hartford, Conn., and Harold W. Frederick Co., Spokane, Wash., as agents to handle industrial sales and service.

—o—

E. W. Buschman Co. Inc., Cincinnati, manufacturer of industrial conveying machinery, has acquired a factory building at Spring Grove and Cifron avenues, Cincinnati, formerly owned by King Machine Tool Co.

—o—

Pressed Steel Car Co. Inc., Pittsburgh, has approved an appropriation for expansion of the company's Domestic Appliance Division in Chicago, to increase production of electric ranges from 40,000 to 100,000 units annually.

—o—

Carborundum Co., Niagara Falls, N. Y., manufacturer of abrasive products, has purchased for $200,000 the former assembly plant of Philco Corp. at 3345 W. 47th St., Chicago. Property consists of an office and warehouse building containing 35,000 sq ft of floor space.

—o—

Pittsburgh Plate Glass Co., Pittsburgh, has acquired the Forbes Varnish Co., Cleveland. The new unit will continue operation as Forbes Finishes Division. There will be no change in personnel with Charles H. Reed, president of the company, continuing as divisional director.

—o—

Iroquois Tool & Machine Co., Lorain, O., has been newly formed and will do production machine work in conjunction with the $4,500,000 plant of Fruehauf Trailer Co. in Avon Lake, O.

—o—

Minneapolis-Honeywell Regulator Co., Minneapolis, manufacturer of industrial control apparatus, has moved its Chicago regional office to 351 E. Ohio St.

—o—

SKF Industries Inc., Philadelphia, recently honored 302 employees who had over 20 years' service with the ball and roller bearing firm.

—o—

Structural Steel & Forge Co., Salt Lake City, Utah, has purchased a calcium tungstate plant in Salt Lake City from War Assets Administration for $81,400. Operated during the war by U. S. Vanadium Corp., the plant occupies a three-acre site containing two manufacturing buildings. The purchaser will use the facilities to expand its production of building materials.

—o—

National Welding Supply Association, Philadelphia, has inaugurated a clearing house bulletin designed to assist members in liquidating surplus stocks or locating scarce materials.

—o—

Ohio Forge & Machine Corp., Cleveland, manufacturer of gears, drop forgings and special machinery, will close its plants July 4 to July 21 for vacations.

—o—

War Assets Administration, Chicago, will offer for sale more than 4000 kegs of nails and a small quantity of plumbing fixtures June 13 through July 2.

—o—

Commonwealth Engineering Co., specializing in applied research, development, designing and engineering in chemistry, mechanics, electricity and electronics, will occupy new quarters in Dayton, O., next month when its research facilities will be more than doubled.

—o—

Chicago Pump Co., Chicago, manufacturer of building and industrial pumps and sewage equipment, will close its plant June 30 to July 14 for vacations.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, has announced that its new solvent oil extraction plant for processing cottonseed is in operation at the plant of Delta Products Co., Wilson, Ark. Engineers say the new method of extraction which replaced a hydraulic press mill will yield 45 extra pounds of oil per ton of cottonseed.

—o—

Buda Co., Harvey, Ill., manufacturer of diesel and gasoline engines and generator sets, has appointed Boehck Equipment Co., Milwaukee, as representative for its products in Wisconsin.

—o—

War Assets Administration will sell or lease a 36-acre ship repair yard, including ways, piers and other facilities, at Portland, Oreg. Property was operated during the war by Willamette Iron & Steel Co.

—o—

Southern States Iron Roofing Co., Savannah, Ga., has reduced its prices on aluminum roofing which now range from $9.50 to $9.57 per square.

—o—

Pere Marquette Railway, Cleveland, announces that its two streamliners put into operation seven months ago have increased passenger traffic 86 per cent, and that increased business will equal total construction costs of the equipment in less than four years.

—o—

Tulsa Boiler & Machinery Co., Tulsa, Okla., has changed its name to Flint Steel Corp. Firm's business as a fabricator of equipment for refineries, gasoline plants and chemical plants will be continued.

—o—

American Can Co., New York, is inaugurating research efforts to find new uses for cans. A company official stated that there has been a far greater increase in volume consumption of canned foods in the past 10 years than in consumption of frozen foods.

The Business Trend

Production Recovers But Outlook Is Clouded

INDUSTRIAL OPERATIONS have returned to a substantial plane following the Memorial Day holiday but the outlook for long continuance of the high level that has prevailed most of this year is clouded by the possibility of a coal miners' strike in about a month.

Observance of Memorial Day was reflected in a drop of STEEL's industrial production index for the week ended May 31 to a point lower than any registered this year except in the first two weeks in January. At 147 per cent (preliminary) of the 1936-1939 average, the index for the Memorial Day week was 13 points below the preceding week. Postwar peak was 164 per cent in the week ended Mar. 22.

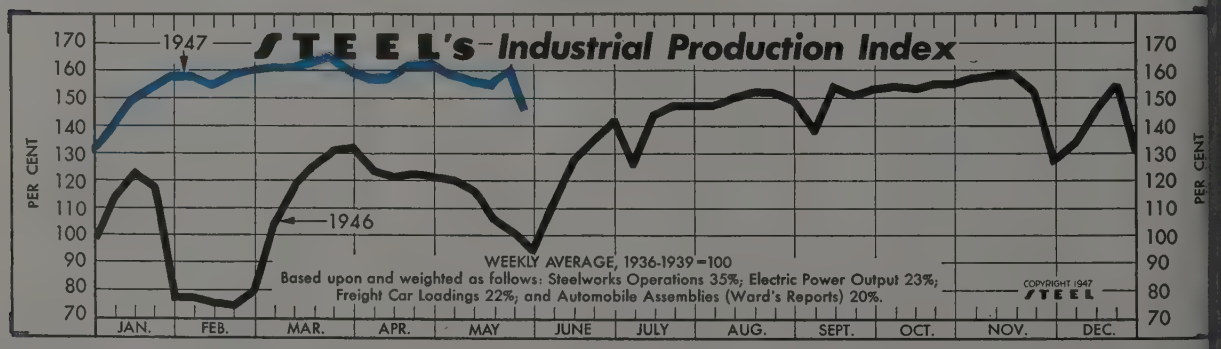
STEEL—Output of steel ingots receded slightly during the holiday week but the production rate was expected to turn upward quickly to postwar peak levels in response to a steel demand that shows no sign of easing. A tendency to blame the lack of steel for suspensions in some manufacturing plants is being opposed by steel producers. They point out that lack of other necessary materials is an important factor in the suspensions and that even if consumers could be given all the tonnage they have asked for the situation would not be eased until all of the other necessities are available.

AUTOS—Memorial Day observance cut the automobile industry's output for the week ended May 31 to an estimated 77,843 passenger cars, trucks and busses, lowest since the third week of January. June production is expected to exceed that of May when material shortages slowed operations, but it is believed that April will have been the best of the first six months of this year.

PRICES—After a two-week halt in the decline that has been under way since the first of April in the U. S. Bureau of Labor Statistics wholesale price average the index again receded, although slightly, in the week ended May 24. The index is now at 146.9 per cent of the 1926 average, compared with 147 per cent in the preceding week.

PRODUCTION INDEX—Industrial production as measured by the Federal Reserve Board's index declined from the postwar high in March of 190 per cent of the 1935-1939 average to a preliminary 187 per cent in April. Manufacturing in both the durable and nondurable goods industries was off slightly from March levels. Postwar high mark in the former was set in March and in the latter in January.

INVENTORIES—Value of inventories held by manufacturers increased during April, while shipments declined slightly. A $450 million rise put the value of inventories slightly above $22 billion. However, in view of the higher costs of goods going into inventories the rise in dollar value of stocks does not indicate a corresponding expansion of physical stockpiles. Manufacturers' shipments in April totaled $13.8 billion, some $200 million less than in March. The decline was centered in the non-durable goods industries.



The Index (see chart above): Latest Week (preliminary) 147 Previous Week 160 Month Ago 159 Year Ago 9

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.5	96.5	94.0	43.(
Electric Power Distributed (million kilowatt hours)	4,429	4,663	4,640	3,74
Bituminous Coal Production (daily av.—1000 tons)	2,137	2,162	2,112	1,27
Petroleum Production (daily av.—1000 bbl.)	5,024	5,025	4,951	4,75
Construction Volume (ENR—Unit $1,000,000)	$72.2	$113.2	$102.5	$71.9
Automobile and Truck Output (Ward's—number units)	77,843	96,651	101,690	31,89

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

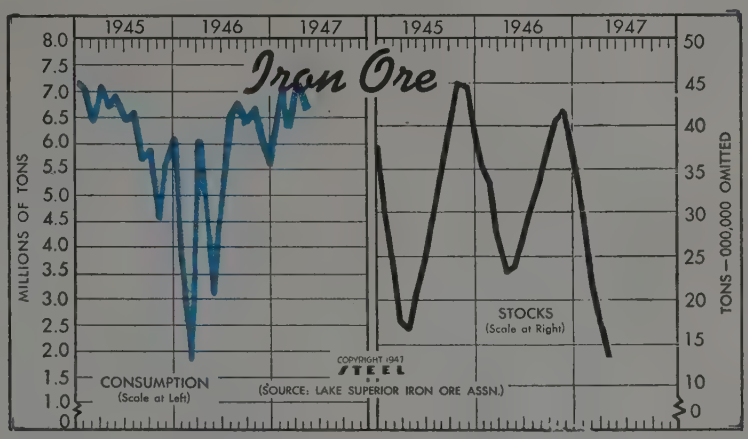
TRADE				
Freight Carloadings (unit—1000 cars)	728†	891	883	627
Business Failures (Dun & Bradstreet, number)	72	102	70	18
Money in Circulation (in millions of dollars)‡	$28,211	$28,116	$28,118	$28,106
Department Store Sales (change from like wk. a yr. ago)‡	+13%	+11%	+15%	+34

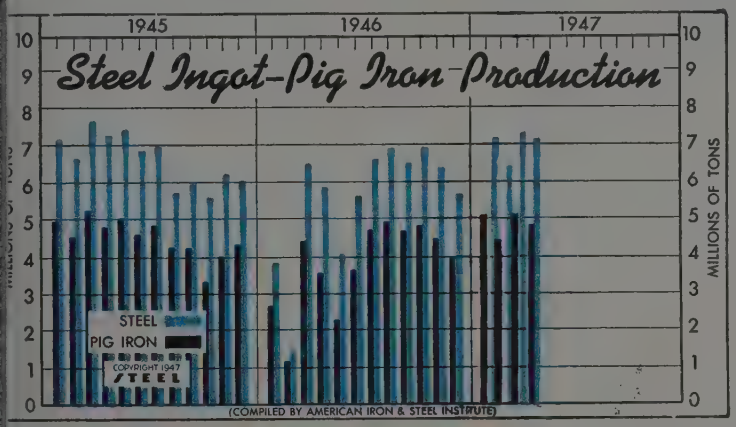
† Preliminary. ‡ Federal Reserve Board.

Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and furnaces	
	1947	1946	1947	1946
....	7,024	3,719	30,514	35,342
).	6,264	1,748	24,317	33,647
r.	6,979	6,021	17,411	27,601
r.	6,579	4,769	13,555	23,079
y	....	2,990	....	23,905
e	....	4,995	....	26,265
y	....	6,460	....	30,439
g.	....	6,738	....	34,067
t.	....	6,380	....	37,573
t.	....	6,625	....	40,435
v.	....	6,131	....	41,919
c.	....	5,516	....	37,465
tal	....	82,093	....	....





Iron, Steel Production

(Net Tons—000 omitted)

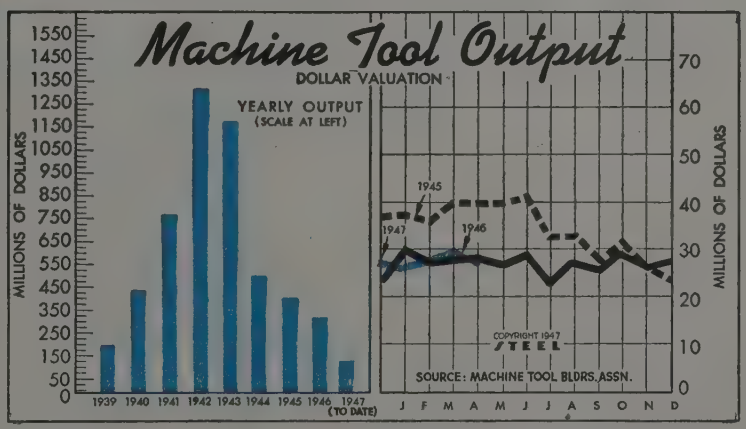
	Steel Ingots			Pig Iron	
	1947	1946	1945	1947	1946
Jan. ..	7,213	3,872	7,204	5,071	2,645
Feb. ..	6,422	1,393	6,653	4,550	1,148
Mar. ..	7,307	6,507	7,706	5,123	4,424
Apr. ..	7,049	5,860	7,290	4,830	3,614
May ..	....	4,072	7,450	....	2,275
June ..	....	5,625	6,841	....	3,682
July ..	....	6,610	6,986	....	4,705
Aug. ..	....	6,887	5,735	....	4,898
Sept. ..	....	6,518	5,982	....	4,687
Oct. ..	....	6,910	5,597	....	4,815
Nov. ..	....	6,409	6,200	....	4,435
Dec. ..	....	5,701	6,058	....	3,992
Total ..	....	66,364	79,702	....	°45,379

° Adjusted.

Machine Tool Shipments

(000 omitted)

	1947	1946	1945	1944
a.	$26,542	$30,263	$37,353	$56,363
b.	26,765	26,949	36,018	50,138
r.	29,012	27,326	40,045	51,907
r.	26,723	28,108	40,170	41,370
y	.....	26,580	39,825	41,819
e	.....	28,580	41,040	41,471
y	.....	22,360	32,504	32,753
g.	.....	26,911	32,500	35,177
t.	.....	25,468	27,300	35,889
t.	.....	29,140	31,200	37,516
v.	.....	26,176	26,084	36,277
c.	.....	27,587	23,276	36,784
tal	.....	$325,448	$407,315	$497,464



NANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,644	$12,476	$11,208	$10,632
Federal Gross Debt (billions)	$258.3	$257.7	$257.9	$273.0
Bond Volume, NYSE (millions)	$13.4	$22.9	$18.8	$16.0
Stocks Sales, NYSE (thousands)	2,998	5,657	4,329	7,247
Loans and Investments (billions)†	$54.9	$55.0	$55.2	$64.2
United States Gov't. Obligations Held (millions)†	$34,580	$34,506	$34,865	$45,965

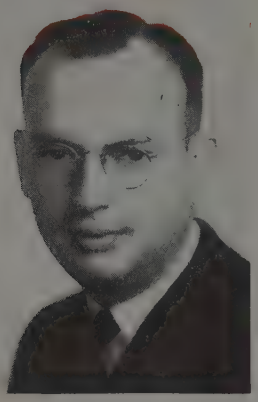
† Member banks, Federal Reserve System.

RICES

STEEL's composite finished steel price average	$69.82	$69.82	$69.82	$63.54
All Commodities†	146.9	147.0	146.8	110.7
Industrial Raw Materials†	160.3	160.2	161.3	124.2
Manufactured Products†	142.1	142.2	141.1	106.2

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry



J. E. TIMBERLAKE

D. W. THOMAS

CHARLES J. HARDY JR.

Jones & Laughlin Steel Corp., Pittsburgh, has announced the following changes in personnel: **J. E. Timberlake,** manager of sales, wire products, has been appointed assistant general manager of sales; **D. W. Thomas,** manager of sales, tin mill products, has been appointed assistant general manager of sales; **J. O'H. Anderson,** assistant general manager of sales, has been appointed district sales manager, New York district office; **S. A. Fuller,** district sales manager, New York district sales office, has been appointed manager, market research department; **Howard A. Knox,** assistant manager of sales, tin mill products, has been appointed manager of sales, tin mill products; **C. E. Kendall,** assistant manager of sales, wire products, has been appointed manager of sales, wire products; and **D. J. Henecker,** assistant manager of sales, wire products, has been appointed manager of sales, wire rope products.

—o—

James Coulter, president and treasurer of the James Coulter Machine Co., Bridgeport, Conn., has resigned, and has been succeeded by **Henry G. Emt,** as president and treasurer. **Edwin W. Thornton** has been elected vice president, and **Royal K. Thornton,** secretary of the company.

—o—

Fred Olsen, chief of research and technical development for the past 16 years of the Western Cartridge Co., division of Olin Industries Inc., at East Alton, Ill., has been elected a member of the board of directors of Olin Industries Inc.

—o—

B. E. Rogers has been appointed works manager of the Western Cartridge Co., division of Olin Industries Inc., East Alton, Ill. He was recently manager of the Fabricating Division of Western Brass Mills, another Olin enterprise, and had been general superintendent of the United States Cartridge Co., Olin's wartime division. **W. M. Hurley,** assistant general superintendent of the United States Cartridge Co., has been appointed assistant works manager of Western Cartridge Co.

—o—

Carl B. Pollock, manager of the Brackenridge, Pa., plant of the Allegheny-Ludlum Steel Corp., has been appointed production manager of the company. He is succeeded as manager of the Brackenridge plant by **George W. Evans,** who has been assistant plant manager.

—o—

Joseph T. Wilson has been promoted to the position of vice president of International Business Machines Corp., Delaware, the affiliate which administers IBM business in Argentina, Brazil, Peru, Chile and Cuba. He previously had been manager of the IBM World Trade Division. **Arch Davis,** executive secretary, has been promoted to the new position of IBM special executive, with special duties to assist IBM corporate officers and officials at its World headquarters in New York. He is succeeded by **Byne B. Waters,** general secretary.

—o—

C. L. Thompson Jr. has been appointed sales and technical advisor to **David P. Reynolds,** vice president and sales manager, Reynolds Metals Co., Louisville. Mr. Thompson will assist on new development and sales for the Aluminum Division.

—o—

William J. Besler has been elected chairman of the board of Besler Corp., Emeryville, Calif., and is succeeded as president by **Timothy E. Colvin.**

—o—

Adm. Ben Moreell, United States Navy, retired, president and chairman, Jones & Laughlin Steel Corp., Pittsburgh, has been elected a trustee and second national vice president of the Navy Industrial Association.

—o—

Charles J. Hardy Jr., executive vice president, American Car & Foundry Co New York, has been elected president to succeed **F. A. Stevenson,** who has resigned after serving with the company for more than 40 years in various capacities.

—o—

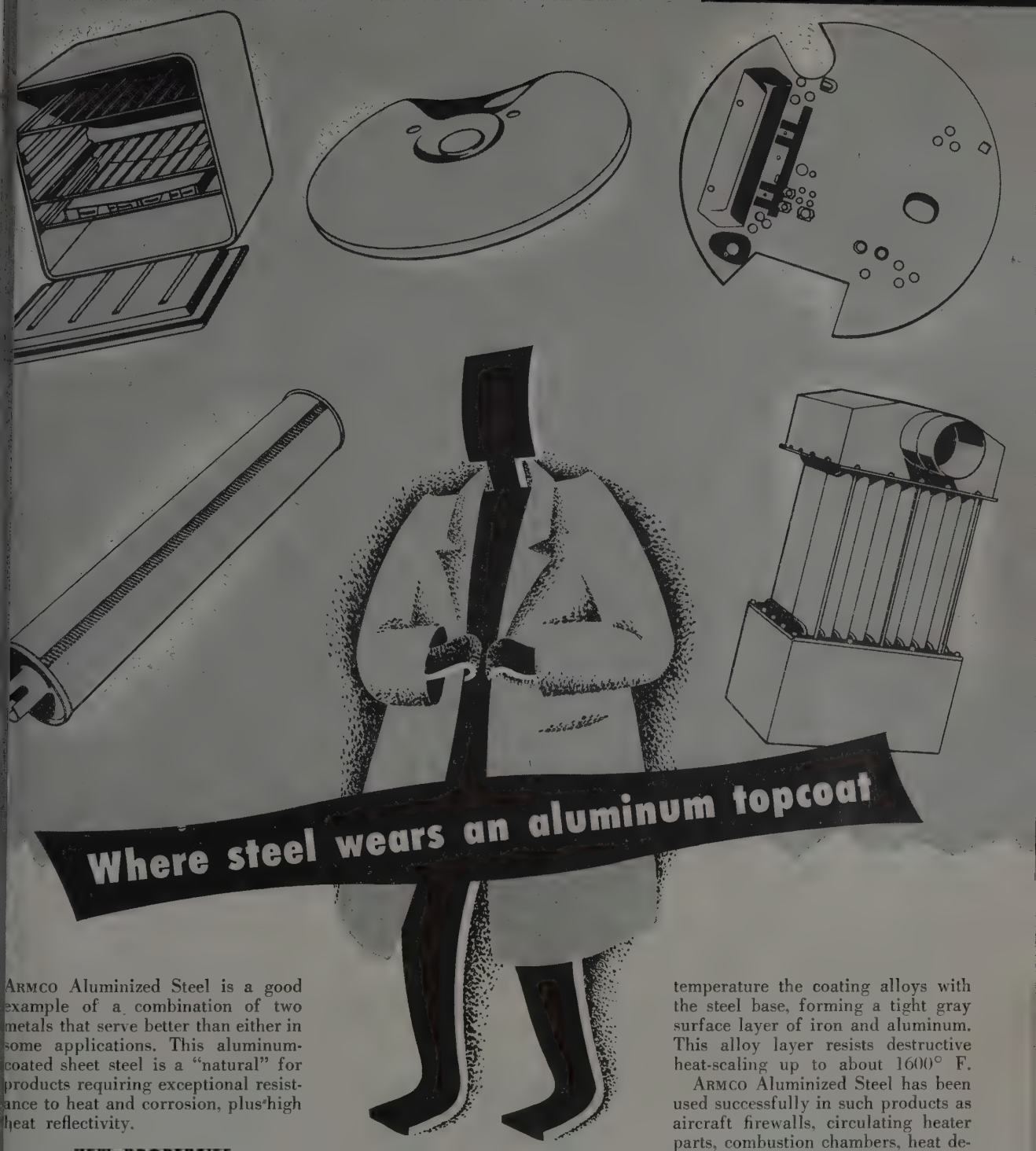
On the 30th anniversary of the founding of the Southern Ferro Alloys Co Chattanooga, Tenn., **Paul J. Kruesi Sr.** one of the founders of the company, announced the election of his son **John Kruesi,** as president. **Frank Naber** former vice president, engineering and sales, has been elected vice president and a member of the board of director **Carl McFarlin,** president of Tennessee Products Corp., Nashville, Tenn., which company has acquired Mr. Paul Kruesi interests, has been elected chairman of the board, and at its request, Mr. Kruesi remains on the board of director

—o—

William Ziegelmueller, vice president and general manager, Electric Steel Castings Co., Indianapolis, has been elected chairman of the Central Indiana chapter of the American Foundrymen's Association. **George E. Clark,** foundry metallurgical engineer for Cummins Engine Co Columbus, Ind., has been elected vice chairman. Other officers are **Jack W Giddins,** secretary, and **Paul V. Faulk** treasurer.

—o—

Albert C. Beeson has been named director of industrial relations, Food Machinery Corp., San Jose, Calif. He will succeed **Glenn A. Bowers,** who plans



Where steel wears an aluminum topcoat

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NEW PROPERTIES

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The corrosion resistance of ARMCO Aluminized Steel is due to the formation of a tight, self-healing oxide film on the aluminum coating. This coating resists heat discoloration up to approximately 900° F. Above this temperature the coating alloys with the steel base, forming a tight gray surface layer of iron and aluminum. This alloy layer resists destructive heat-scaling up to about 1600° F.

ARMCO Aluminized Steel has been used successfully in such products as aircraft firewalls, circulating heater parts, combustion chambers, heat deflectors, heat exchanger tubes, automotive mufflers and oven liners.

If your products require resistance to heat and corrosion, this special coated sheet steel may be the answer to your problems. Write us for full information. Just address The American Rolling Mill Company, 2261 Curtis St., Middletown, Ohio.

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olling Mill Company

ALUMINIZED ★ ARMCO ★ STEEL

Special-Purpose Sheet Steels • Stainless Steel Sheets, Strip, Plates, Bars and Wire

enter the field of education and labor research. Mr. Beeson had been connected with the National Union Radio Corp., Newark, N. J.

—o—

Dr. Charles A. Thomas, vice president and technical director, Monsanto Chemical Co., St. Louis, has been elected executive vice president of the company. **Felix N. Williams,** vice president and general manager of the Plastics Division, Springfield, Mass., has been elected to the board of directors. The company also announced that five additional vice presidents have been elected: **Josiah B. Rutter,** general manager, Merrimac Division, Everett, Mass.; **Dr. C. A. Hochwalt,** director of the central research department, Dayton, O.; **William W. Schneider,** secretary of the company and head of the legal department; **Daniel M. Sheehan,** comptroller; and **C. A. Wolfe,** director of purchases and traffic.

—o—

Arthur L. Gardner, production manager, Merrimac Division, Monsanto Chemical Co., St. Louis, has been appointed assistant to the division general manager, to deal primarily with production problems.

—o—

J. M. Davies, formerly assistant director of the research department, Caterpillar Tractor Co., Peoria, Ill., has been promoted to associate director of research in administrative charge of the department. **R. C. Williams** has been appointed assistant director of research in charge of tractor and earthmoving projects.

—o—

C. M. Jacobs has been appointed assistant purchasing agent for the Dumore Co., Racine, Wis. He served the company in the production and cost department from 1933 to 1941, and now returns after six years of purchasing for the Hamilton Beach Co., Racine, to succeed **W. Thompson,** assistant purchasing agent, who has been transferred to a similar capacity with the Greene Mfg. Co., Racine, a Dumore subsidiary.

—o—

William G. Findlay has been appointed manager of the Pittsburgh plant of Joseph T. Ryerson & Son Inc. He succeeds **Howard L. Robinson,** who has been given a special assignment at the Cleveland plant of the company. Mr. Findlay has been associated with the company for 25 years, and was recently head of the work order division at Chicago. He is succeeded in that position by **C. W. Schoenberg.**

—o—

Dr. Harold A. Vonachen, medical director at Caterpillar Tractor Co., Peoria, Ill., has been elected president of the American Association of Industrial Physicians & Surgeons for 1947-48. He had been serving as first vice president.

—o—

J. H. Jewell has been appointed manager of apparatus sales, Westinghouse Electric Corp., Pittsburgh. He has been associated with the company for 27 years, and has served as manager of the company's industry sales departments since 1944. He has recently been acting manager of apparatus sales.

—o—

J. G. Paule has been appointed vice president and assistant general manager of Wilson Foundry & Machine Co., Pontiac, Mich. He had been secretary and treasurer of the company, and is succeeded in that capacity by **Myron Hill,** formerly comptroller. **B. E. Drury,** formerly sales manager of the company, has been promoted to general sales manager.

—o—

George A. Smith, assistant plant manager at Meriden, Conn., for New Departure Division of General Motors Corp., has been appointed general manufacturing manager of the division. **Edward E. Gill** is reappointed general production manager, **Seth H. Stoner** becomes acting chief engineer during the illness of **T. C. Delaval-Crow, Robert E. Young** is transferred from Meriden to become director of inspection, **Joseph A. Ashwell** is reappointed director of purchases, **L. G. Sigourney** is reappointed general sales manager, and **Robert T. Collins** is made director of personnel.

—o—

John Regan has been appointed vice president of John Mather Lupton Co. Inc., New York, and manager of the Technical News Division of the agency.

—o—

Tony Reitberger has been appointed assistant chief engineer of the Warren City Mfg. Co., subsidiary of Federal Machine & Welder Co., Warren, O. Associated with press manufacturers for the past 17 years, Mr. Reitberger recently was associated with the Clearing Machine Corp., Chicago, as design engineer and engineering department head in charge of the Heavy Mechanical Press Division.

—o—

John G. Gaisser, recently separated from the Naval Reserve, has been elected controller of F. H. McGraw & Co., Hartford, Conn.

—o—

Thomas H. Latimer has been appointed executive engineer in charge of engineering, drafting, and estimating by the John Waldron Corp., New Brunswick, N. J. He was recently chief engineer of the Black-Clawson Co., Hamilton, O., with whom he had been associated for the past ten years.

—o—

Charles H. Reed, president of the Forbes Varnish Co., Cleveland, has been appointed divisional director for the Forbes Finishes Division, which division

J. M. DAVIES

R. C. WILLIAMS

THOMAS H. LATIMER

= less than $\frac{3}{100{,}000{,}000}$ lb. of water per cu. ft.*

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has been created by the acquisition of the Forbes Varnish Co. by the Pittsburgh Plate Glass Co., Pittsburgh, and which will continue operation as the Forbes Finishes Division of Pittsburgh Plate Glass Co.

—o—

Julius J. Domonkos has been appointed vice president of manufacturing, Bell Aircraft Corp., Buffalo. **Robert A. Stanley**, chief test pilot, has been named vice president of engineering. **Charles L. Beard** and **D. Roy Shoults**, vice presidents, have resigned, and Mr. Beard has also resigned as a director of the corporation.

—o—

Reese B. Lloyd has been named manager of the western plants of Rheem Mfg. Co., San Francisco. He has been succeeded as manager of the company's Chicago plant by **Donald J. Kooker**.

—o—

C. Thomas Miller has been named eastern regional manager of appliance sales for Rheem Mfg. Co., San Francisco. He will make his headquarters in New York. He succeeds **W. W. Stevens**, resigned.

—o—

W. H. Houghton, treasurer of Bendix Aviation Corp., Detroit, has been elected a vice president of the company.

—o—

Edwin M. Martin and **Francis L. Elmendorf** have been elected directors of Farnsworth Television & Radio Corp., Ft. Wayne, Ind. Mr. Martin is vice president and secretary of the company, and Mr. Elmendorf is vice president of Robert Heller & Associates, Cleveland, management consultants. **D. M. Allgood**, formerly sales manager of the Willard Storage Battery Co., Cleveland, has been elected a vice president of the company.

—o—

C. R. Heller, Washington representative for the Link-Belt Co., Chicago, has been named to head the sales office, re-established in Washington, and which is located at the Washington Gas Light Bldg., 11th & "H" Sts., N. W. His duties will be confined to work with foreign purchasing commissions and with the governmental and armed service bureaus located in Washington.

—o—

The American Shipbuilding Co., Cleveland, has announced the appointment of **A. Nelson Fountain** as superintendent of its subsidiary, the Buffalo Dry Dock Division.

—o—

The Link-Belt Co., Chicago, has announced an expansion of the financial staff of the company, and has appointed **Franklin C. Schimpf** as controller; **Harry E. Kellogg**, secretary and treasurer; **F. H. Brandt**, general auditor; **M. P. Anderson**, assistant treasurer; **H. C. Oakes**, assistant treasurer; **H. W. Aden**, assistant secretary; and **C. W. Marum**, credit manager. They all have offices at the executive headquarters in Chicago.

—o—

George S. Starke, general sales manager, Sperry Gyroscope Co. Inc., subsidiary of the Sperry Corp., New York, has been named a vice president of the firm.

—o—

Charles G. Terry of New York and **R. J. Wysor** of Cleveland have been elected to the board of directors, Dominion Steel & Coal Corp. Ltd., Montreal, Que. Mr. Terry is president of the American Securities Corp. and a director of the Colorado Fuel & Iron Corp., Denver. Mr. Wysor is metals consultant with the U. S. Department of State, and he was formerly president of Republic Steel Corp., Cleveland.

—o—

C. F. Moersch Jr. has been named sales engineer for Vulcan Mold & Iron Co., Latrobe, Pa. He previously had been associated with Vanadium-Alloys Steel Co., Latrobe.

—o—

Charles M. Mapes has been appointed industry manager in charge of aluminum foil sales for the consumer goods program at Reynolds Metals Co., Richmond, Va.

—o—

George M. Thursby has been elected vice president in charge of industrial relations, and **William Foster**, secretary, of H. C. Frick Co., subsidiary of U. S. Steel Corp., Pittsburgh. Mr. Foster has also been elected secretary of United States Coal & Coke Co. He will continue his former position as general attorney for both subsidiaries.

—o—

Charles S. Northen, sales manager, Sloss-Sheffield Steel & Iron Co., Birmingham, has been named vice president in charge of sales.

—o—

G. S. Perkins has been appointed sales manager for Musaphonic radio receivers, General Electric Co., Schenectady, N. Y. **F. M. Falge**, sales executive for the lamp department at Nela Park, Cleveland, has been promoted to assistant manager of the department's Pacific sales district.

—o—

Several changes and new additions made in the Housewares Sales Division, Ekco Products Co., Chicago, are: **Edward Marder**, a director of the company and sales representative in the Detroit area, has returned to the Chicago office to assume charge of all customer and consumer relations. He is succeeded in Detroit by **William W. Campbell**, who has been field representative for the Firestone Tire & Rubber Co., Akron, in the St. Louis area. **Mrs. Iris Murdock**, formerly president of Murdock Metal Products Inc., prior to its becoming a subsidiary of Ekco, has become associated with the company and is in charge of the firm's nationwide staff of demonstrators. **John W. Roberts** has been appointed a representative in Kansas, Oklahoma, western Missouri and Arkansas and northern Texas, with headquarters in Kansas City, Mo.

—o—

Albert T. Bergeron, sales manager of the Illuminating Division, Miller Co., Meriden, Conn., has been appointed manager of the division. He will continue to direct lighting sales.

—o—

James H. Binger has been elected assistant vice president of the Minneapolis-Honeywell Regulator Co., Minneapolis. He has been assistant secretary of the company. He will devote most of

RAY H. SULLIVAN

Elected vice president in charge of manufacturing, E. W. Bliss Co., Detroit. Noted in STEEL, June 2 issue, p. 96

E. A. IRWIN

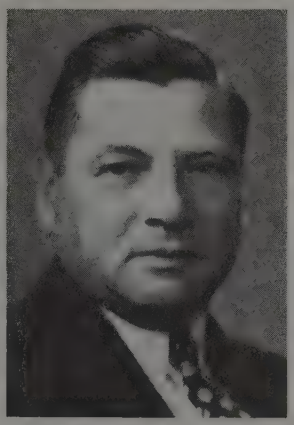
Elected vice president in charge of sales, E. W. Bliss Co., Detroit. Noted in STEEL, June issue, p. 96

EDWARD J. HELLINE

pointed general sales manager, Reliance ision, Eaton Mfg. Co., Cleveland. Noted in STEEL, June 2 issue, p. 97

E. E. MICHAELS

Appointed manager of operations for Chicago Bridge & Iron Co., Chicago. Noted in STEEL, June 2 issue, p. 94



F. W. MARSCHNER

Appointed general manager, New Departure Division, General Motors Corp., at Bristol, Conn. Noted in STEEL, June 2 issue, p. 92

attention to the sales department, d will assist **Thomas McDonald,** vice esident in charge of sales.

—o—

Joseph W. LeDonne has been apinted resident controller of the Edgeater, N. J., office of the new Interational Division of Ford Motor Co., earborn, Mich. He had been assistant sident controller of assembly plant opations at the plant.

—o—

Lester F. Cox, vice president, Theroid Co., Trenton, N. J., has been elected to the board of directors of the company to succeed **Walter J. Harvey,** who as resigned.

—o—

American Foundrymen's Association as announced election of chairmen and ice chairmen of seven divisions for the 1947-49 term as follows: Brass and Bronze Division — **Walter W. Edens,** Ampco Metal Inc., Milwaukee, and **George P. Halliwell,** H. Kramer & Co., Chicago. Gray Iron Division—**Russell J. Allen,** Worthington Pump & Machinery Corp., Harrison, N. J., and **R. G. McElwee,** Vanadium Corp. of America, Detroit. Malleable Division—**Leon J. Wise,** Chicago Malleable Castings Co., Chicago, and **William B. McFerrin,** Electro Metallurgical Co., Detroit. Steel Division—**Laurence H. Hahn,** Sivyer Steel Casting Co., Chicago, and **Charles Locke,** West Michigan Steel Foundry Co., Muskegon, Mich. Sand Division—**Dr. H. Ries** and **Prof. Peter E. Kyle,** of Cornell University. Pattern Division—**Albert F. Pfeiffer,** Allis-Chalmers Mfg. Co., Milwaukee, and **Leonard F. Tucker, City** Pattern & Foundry Co., South Bend, Ind. Educational Division—**Fred G. Sefing,** International Nickel Co., New York, and **Alfred W. Gregg,** Whiting Corp., Harvey, Ill.

—o—

Paul B. Reed, Perfex Corp., Milwaukee, has been elected chairman of the Milwaukee section of the American Society of Refrigerating Engineers, and **J. H. Mikula** and **E. J. Kocher,** vice chairmen. **A. Huenecke** has been elected secretary, and **F. E. Gaedeke,** treasurer.

—o—

R. Bruce Hunter has been appointed manager of the Gary, Ind., plant of American Bridge Co., subsidiary of U. S. Steel Corp., Pittsburgh. He succeeds **W. A. Thiel,** who has been placed in construction and maintenance of the company's western division plants at Gary and Minneapolis.

OBITUARIES . . .

Thomas S. Hemenway, 65, founder nd president of the Metal & Alloy Specialties Co., Buffalo, died May 24 of a eart attack. He was president of the Vational Non-Ferrous Foundrymen's Association.

—o—

John A. Bennan, 69, chairman of Jefferson Electric Co., Bellwood, Ill., died ecently.

—o—

Arthur B. Betz, 71, co-founder and wner of S. A. E. Steels, Cleveland, died May 29. He had organized and headed he Betz-Pierce Co., Cleveland, and had been associated with the Super Steels Inc. and Federal Gears Inc., Cleveland.

—o—

Jesse W. Reno, 85, inventor of the escalator, died June 2 in Pelham Manor, N. Y. Mr. Reno had been president of the Reno Marine & Salvage Corp., New York, as well as the Folding Liferaft Appliance Co., New York, before he retired 15 years ago.

—o—

George E. Price Jr., 57, purchasing agent, Goodyear Tire & Rubber Co., Akron, died May 30. He had been associated with the company 25 years.

—o—

Henry B. Mueller, 57, president and treasurer of the Spring City Pattern Works at Waukesha, Wis., died May 31. He had been retired for the past five years.

—o—

John A. St. Clair, 64, sales engineer, E. C. Atkins Co., Indianapolis, died recently in Anderson, Ind.

—o—

William A. Morgan, 75, at one time president of the Buffalo Copper & Brass Rolling Mill, Buffalo, which he sold to the American Brass Co., Waterbury, Conn., in 1918, died May 27. He had also been connected with the Curtiss Aeroplane & Motor Co., predecessor of the Curtiss-Wright Corp., New York, as vice president and general manager. He has been retired for several years.

—o—

Thomas T. Read, 67, professor emeritus of mining engineering at Columbia University, died May 29 at White Plains, N. Y.

—o—

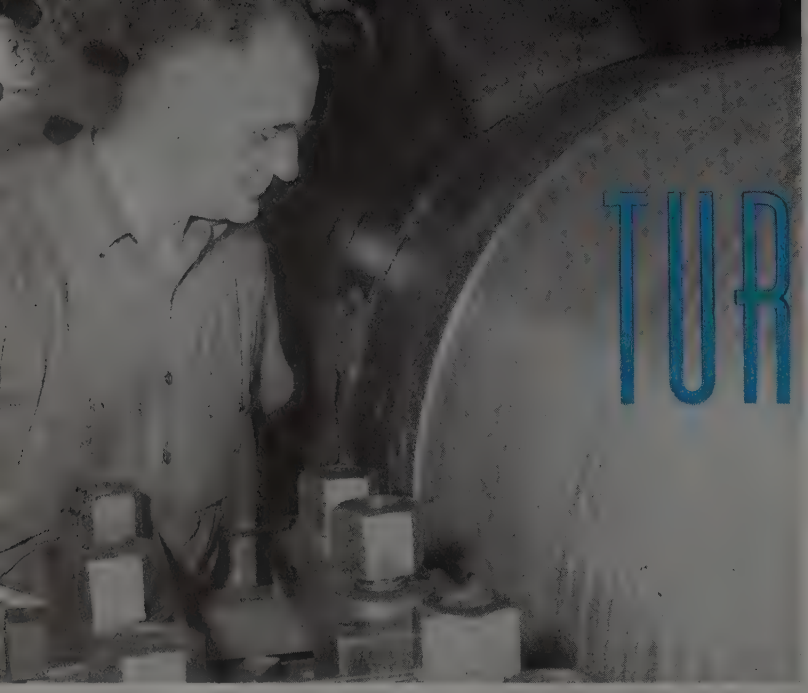
George A. Hastings, 68, president, Austin-Hastings Co. Inc., Boston, died May 26. He was formerly with Brown-Wales Co. and Edgar T. Ward & Sons Co., Boston, and was a specialist in seamless mechanical tubing.

—o—

George L. West, retired production manager of the John Deere Plow Co., Syracuse, N. Y., died recently.

—o—

Walter H. Pease, 66, president of the F. B. Pease Co., Rochester, N. Y., died recently.



On big jobs such as this one, negative rake carbide tools cut cost of roughing cuts and carbide finishing tools give fine surface quality

By GUY HUBBARD
Machine Tool Editor, STEEL

TURNING....

Part 1 of a Series, Emphasizing Ways and Means of Cutting Costs and Increasing Production Through the Instrumentality of

MODERN MACHINE TOOLS

ORIGIN of the turning process, and ancestry of the lathe, both are lost in the dim mists of antiquity. The process, and the basic machine for carrying on that process, logically can be traced back to the potter's wheel. That ancient machine, still in use today in its primitive form, is a revolving table by which lumps of clay are molded by the hand and by simple hand tools into symmetrical forms such as bowls, vases, etc. The idea of shaping harder materials by "progressively removing it in the form of chips", easily could have been suggested by this forerunner of the vertical lathe.

The earliest known horizontal lathes were nothing more than two dead centers between which the workpiece was revolved one way and then the other by the string of a bow worked by hand, or by a cord from a flexible pole overhead, attached to a foot treadle under the lathe. The string or cord was wound around the workpiece and the cut was taken by a hand-held tool only as the work revolved toward the operator. The back stroke was of that brand called a "nonproductive phase of a cycle" which good machine tool designers constantly strive to eliminate or minimize in modern machines.

Like the potter's wheel, bow lathes and pole lathes still are in use in many parts of the world in their primitive form. John Browning, noted inventor of repeating and automatic guns, began his apprenticeship running a pole lathe in the shop of a gunsmith in Utah. The flexible pole of the driving mechanism of that lathe was the limb of a living tree which overhung the shop. Even in the United States we really are not very far removed from the most primitive kinds of machine tools. Progress made by American machine tool builders within a comparatively few years therefore is all the more remarkable.

It is true, of course, that Henry Maudslay developed the prototype of the modern screw cutting engine lathe in London, England, about 1800. That rightly has been called "the first great improvement in the lathe". However, Henry D. Stone and Frederick W. Howe designed and built the first commercially successful turret lathe at Windsor, Vermont, about 1848, theirs being truly "the second great improvement in the lathe". Then Christopher M. Spencer of Hartford, Conn., patented the original automatic turret lathe in 1872, his being "the third great improvement in the lathe".

I remember Mr. Stone as one of the village elders, and in 1920 I spent a week with Mr. Spencer at Mohonk Lake, N. Y. That's how close we are to the beginning of things here in the U.S.A.

Where did we go from there, where are we now, and toward what goals are we headed, as far as lathe developments and turning techniques are concerned? That is a difficult set of questions to answer for the reason that turned work ranges all the way from tiny staffs for watches —machined under a magnifying glass—up to huge cylinders, drums, rotors, etc., the transportation of which taxes the capacity and ingenuity of our Class I railroads.

One thing is certain, however, and that is that so far the so-called "more advanced types of lathes" by no means have backed the more basic types off the map. For example, turret lathes have not eliminated engine lathes and automatics in turn have not eliminated turret lathes. In both cases, the new competition has so stimulated invention that modern engine lathes constantly challenge the ascendency of turret lathes and turret lathes more than hold their own in the "fringe competition" with automatics.

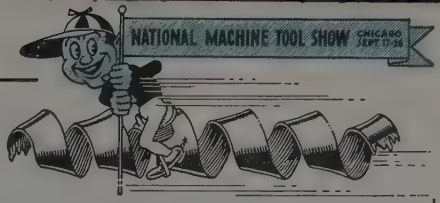
It is true that each type of machine has certain rather definite areas in which it holds its own against other types,

t rivalry for business in the intermediate areas is a con-
nt challenge to designers and tool engineers.

In addition to rivalry with each other, all types face
mpetition with grinding and with plastic forming meth-
s. For instance, automatics used to be called "screw
achines". As other methods of screw making were de-
loped, these machines went from single spindle to four,
e, six and eight spindles in the race for production.
entually a considerable amount of standard screw man-
acturing shifted to other types of machines—including
ld heading and roll threading machines and now in
ne cases to centerless grinders.

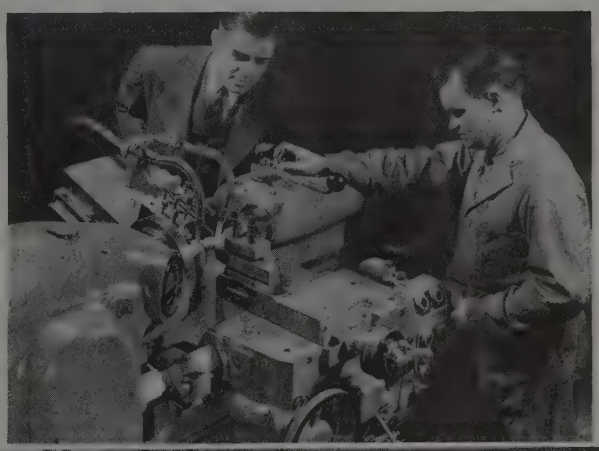
In the meantime, however, design and tooling of auto-
atics was improved and broadened in scope to handle
infinite variety of work other than screws, at speeds
d to limits of accuracy undreamed of by old-time screw
achine men. The result of the decline of screw machin-
g was that the builders of automatics were "kicked up-
airs", where their level of operations is far above any-
ing that they ever would have achieved had they clung
sperately to screw making operations.

In the field of engine lathes there was at one time a
ther sharp distinction between (*Please turn to Page* 122)



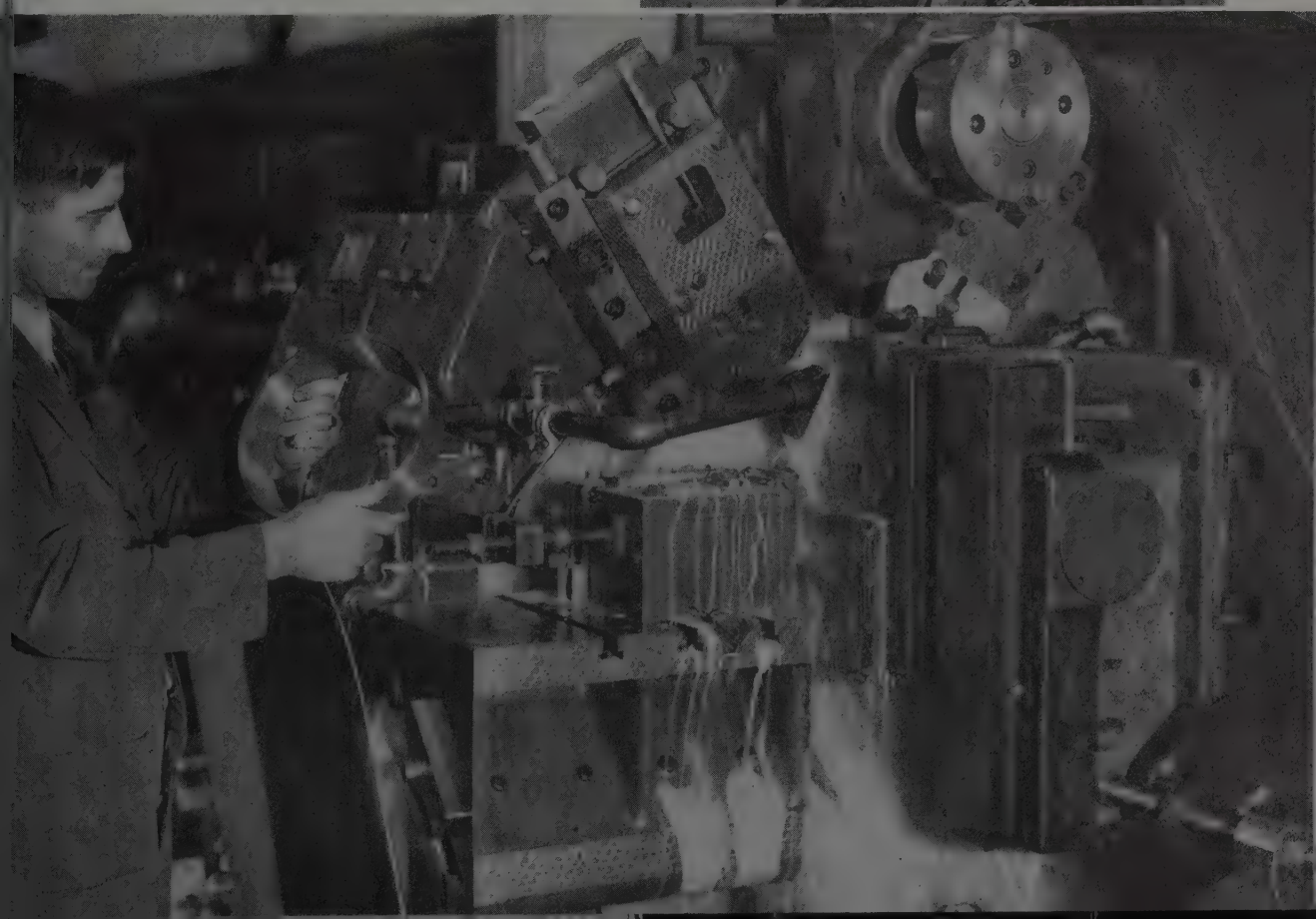
There is hardly a shop in the world in which turning is not a basic operation—and in many cases the major operation. Advances made in turning techniques and in machines for all kinds of turning operations, since the 1935 show, can be realized completely and studied in detail only by attending this 1947 show. That alone makes it a "must".

Of the 1000 machine tools which will be exhibited under the aegis of the National Machine Tool Builders' Association at the Dodge-Chicago plant, September 17-26, 1947, a large number will be concerned with turning operations of every conceivable size and variety.



This highly developed relative of the engine lathe (right) will machine shaft work, gear blanks, bushings, etc., under manual or semiautomatic control. Monarch Machine Tool Co. photo

Fully automatic, carbide tooled machine (below) turns, bores, chamfers and cuts off Timken bearing rings from high tensile seamless steel tubing up to 124 *in. diameter. National Acme photo*



Metal-to-wood laminates—hard plywood cores singly or doubly faced with a choice of metals—are finding expression of their unique qualities in architecture, modern high-speed trains, truck and trailer bodies, commercial furniture, escalators and industrial equipment

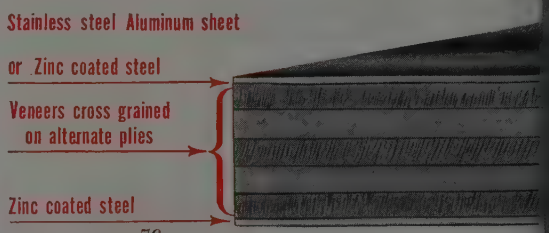
Composit

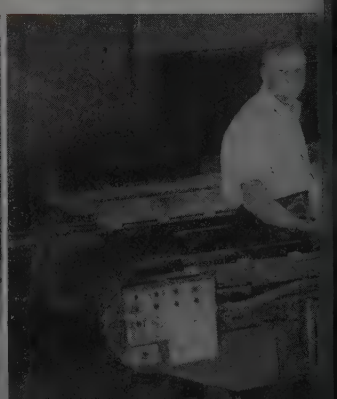
COMPOSITE material is the Janus of many of today's cleverly engineered lighter structures. Like that ancient Roman diety, it often presents two faces—sometimes the same, sometimes different ones—having a common back or trunk. The resemblance does not stop there. Also like Janus, the composite structural engineering material can frequently be found "guarding" doors, doors to buildings, passenger elevators, truck-drawn trailers, proofing rooms in commercial bakeries and kitchen cabinets, to mention only a few.

Pushing past the doors and into the structure itself, the investigator of laminated or composite materials is bound to be impressed by the variety of combinations and diversity of applications which have been successfully developed. Metal is joined to metal in strips, sheets or plates, and metal is bonded to wood, plywood or plastic to achieve striking decorative effects or serve some utilitarian purpose at less weight and occasionally lower cost than a homogeneous material comparable in structural strength or other desired properties.

There are actually two distinct family groups among the composites. The sandwich materials of the first group are all metals, a panel generally consisting of low-carbon or mild steel sheet or plate with facing sheets made from alloy or stainless steel, aluminum, Monel, or other abrasion and/or corrosion-resistant or decorative material. De pending upon the requirements, facing sheets of one un can be of dissimilar types such as steel and aluminun stainless and Monel, etc., and they are nearly always extreme thinness, for herein lies the economic justificatio for combining laminations of dissimilar metals. The rel tively more expensive kinds can be depended upon to fu fill their special function, even when present in such r duced quantities, because of the inherent strength an load-carrying capacity of the multi-ply structure.

This combination of metals does not have the field e clusively to itself, but is the commonly accepted metho where there are to be two exposed or working faces i one panel. Clad metals, combinations of carbon stee and either very hard or very highly finished materials lik the 18-8 composition, of course are composites but a specified for most applications in two thicknesses onl Clad metals particularly have made great strides towar technical excellence and are available in such variety form and finish that they are worthy of more attentio than can be paid to them in this article, primarily devote to an exposition of one type whose merits and applic tions is a story in itself. This one incorporates in a sing tightly bonded panel two of the oldest and one of the new est of man's materials—woods, metals and plastics. Th second group is also growing in commercial importanc and as a material of construction. It claims not only th advantages previously listed but wide application in pro ucts of several large industries.





Materials

. . . Attract Designers of Lighter Structures

Fig. 1—Metal-covered plywood jacket comprises housing, down to trucks and fender, of this Kansas City Southern railroad diesel locomotive. Note radius forming at nose

Fig. 2—Cross-section of composite with face and back sheets of the same or alternate metals and 5-ply core of hardwood

Fig. 3—Line of veneer tables with tapeless tapers in operation

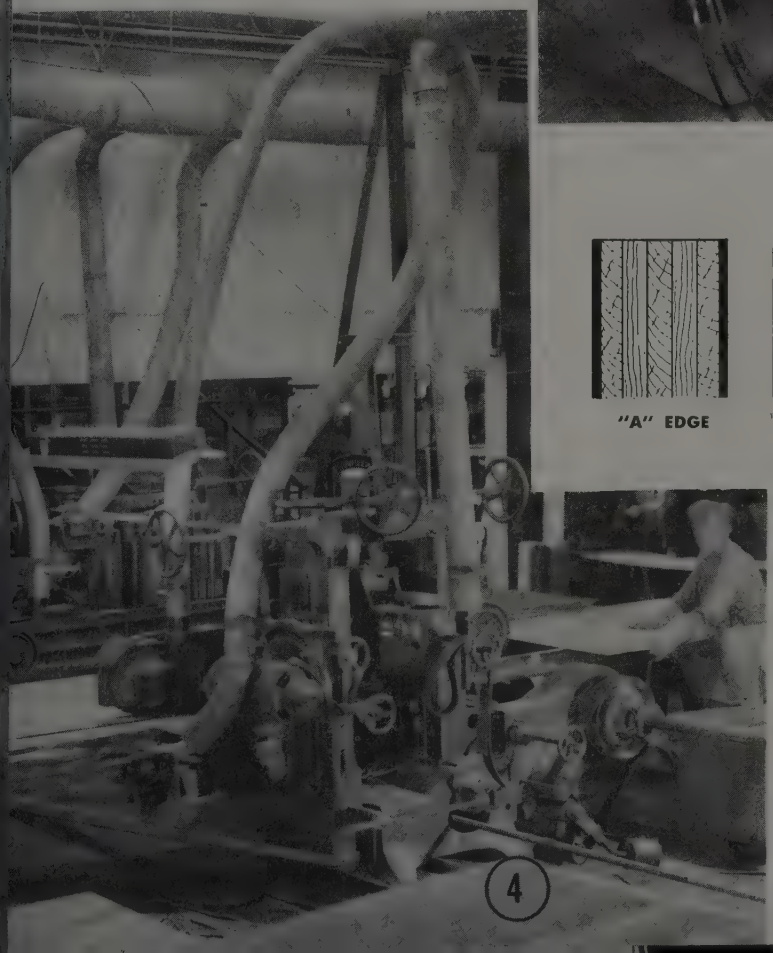


Fig. 4—After conditioning, plywood plaques go to double cut-off caterpillar saws like this one

Fig. 5—Standard types of Plymetl edges, after locking, the three at right can be soldered for complete exclusion of moisture. In less extreme cases, mastic or paint will serve

Fig. 6—One method of sawing large metal and plywood panel

Fig. 7—For drilling large holes, tip of twist drill can be modified as at right

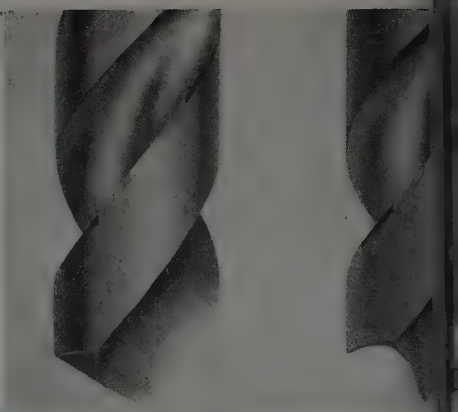
Fig. 8—Type of boring tool recommended for wood-metal composites

Fig. 9—Simple dies and a hydraulic press will make simple curvatures of the type shown here

Fig. 10—Schematic of compression rolling, another method for simple forming

Fig. 11—Special composite with single thickness of veneer for exterior finish bonded and formed to shape with steel or aluminum backing sheet

Fig. 12—Typical construction details for section and partitions in railway coach. From Haskelite "Railroad Car Designers Handbook"



In the manufacture of composite sheets, one of the largest producers, Haskelite Mfg. Corp. of Grand Rapids, Mich., permanently bonds light gage metals to one or both sides of a veneer or plywood plaque. Other kinds of core material (insulating board, etc.) also are being used to make additional types. To these cores, metal faces of zinc-coated steel, aluminum, Monel metal, stainless steel and porcelain enameled steel, from 24 to 28-gage, may also be bonded. The resulting product, known as Plymetl, is a material of unusual strength, light weight and rigidity. It has great resistance to impact and vibration, as required by railway and truck or trailer installations, and in many cases has supplied the necessary structural qualities of metal of several times its weight.

A good example of serving double functions—where utility and decoration join in a wind-streamed version of modern transportaiton—is the Plymetl-sheathed locomotive which pulls a streamlined Kansas City Southern railroad train in Fig. 1.

Inasmuch as the facing materials are essentially designed to stand up under adverse conditions, the composite is impervious to mold and fungi as well as atmospheric corrosion, when the edges are protected. Other features which make it attractive to fabricators and builders are its high rating for dimensional stability, its flat and smooth surfaces and fire-retardant, sound deadening and insulating values.

The plywood plaque may consist of a single ply of veneer or a plywood panel. In a plywood panel all plies except the center ply occur in pairs. In any pair the veneers are of the same thickness and direction of grain and are arranged symetrically on opposite sides of the center ply. The longitudinal direction of the panel is along the face grain of the plaque, transverse direction of panel is across the face grain of plaque, irrespective of panel dimensions. (See Fig. 2.) This provides a structurally sound panel having uniformly high strength both along the grain and across the grain. Solid lumber on the other hand is only strong in one direction.

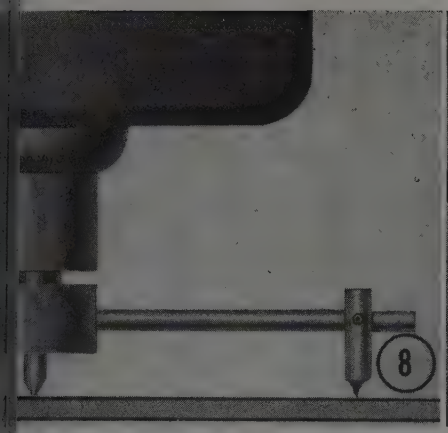
The metal sheet surfaces of this composite are called the face and back. In most cases both metal surfaces are identical, also indicated in Fig. 2. In other cases, metal surfaces may be dissimilar or one surface may be omitted.

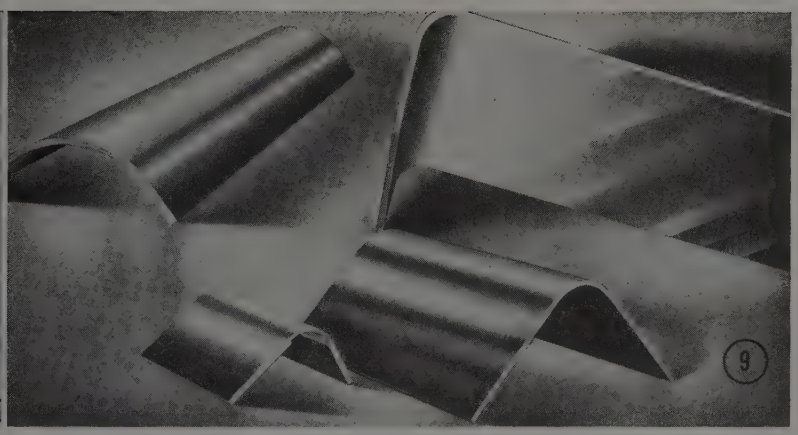
An interesting feature of this type of sandwich material is its adaptability to most methods of fabrication. It can be sawed, drilled, routed and bored. It can be bent or molded, depending upon requirements. It may be fastened in place with nails, bolts, screws or rivets. T panels may be soldered, brazed or copper arc welde depending upon the metal faces used. If highly deco tive effects are wanted, the material will take and reta a fine finish—with some facing metals, a mirror-like qu ity—free from distorting highlights. In all these proce ing operations, time is markedly reduced because the m terial yields readily to modern high-speed tools a methods.

The plywood plaques or cores to be used in composi panels are prepared with care, for manufacturing proc dure must insure delivery to the Haskelite metal lamina ing department of only the finest quality plywood, kn free, flat, dry and firmly bonded. Single sheets are rotary cut and defects are trimmed out on veneer clippe as they would show through the thin-gage facing met particularly if it were steel or aluminum. Knots will n hold the glue bond. As a guarantee against possible e pansion or contraction of separate pieces going into t plywood structure, temperature is maintained at 70° throughout the main plant and humidity at 50 per ce (Moisture content varies from 8 to 10 per cent.) If co ditions were not controlled, there could be expansion in single laminate of as much as ½-in. for every 1 per ce change in moisture content in a 25 ft width.

Laminates varying from 1/28 to ⅛-in. thickness a spliced on "tapeless tapers", special machines shown Fig. 3 to whose development company engineers contri uted. Individual sheets are "miked" for thickness befo bonding, a close tolerance being adhered to in each cas In the lay-up section of the plant panels are made up wi film or sheet glue basically phenol formaldehyde. Th is a tissue thin piece of paper with glue impregnated it. It is sheared to panel length from a roll and strips a interlarded between wood plies. Three of Haskelites' hot platen presses provide the heat and pressure to me the glue and bond the veneers together in producir plaques for joining to metal. One of these, a Francis, w accommodate six plywood sections up to 63 x 124-in. a time. A Plycor press nearby has 16 openings wit working space 50 x 100-in. Time in the press depen upon thickness of panel being bonded. It is generally 1 to 20 min.

Plywood plaques go from the presses to the conditio ing kilns. After they have been conditioned they go dire to the double cut-off saws in Fig. 4 which square up eac side. One of these saws is adjustable for width. Both a



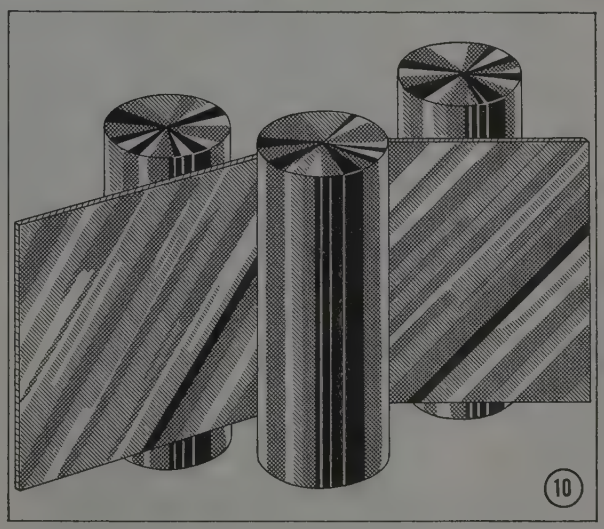


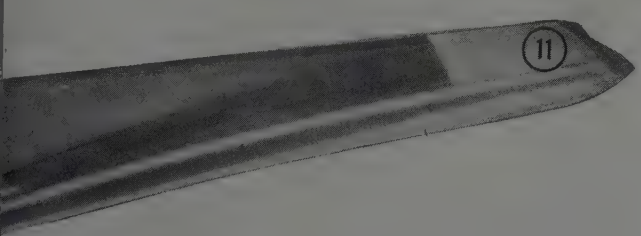
terpillar type, driven by upper and lower caterpillar ed chains. Plaque inspection occurs here and they are so given final size. Plywood panels used in metal and ood paneling for commercial truck bodies, for interior neling of railway streamliner dining cars, or any other plication where good appearance is of the essence, move om the saws to drum sanders where they are given a e surface finish.

Finished plywood panels next are taken to the metal-orking shop, a large, well lighted wing in the main build-g. This shop is equipped with the most modern sheet etal equipment. Included are a Cincinnati drop brake, ft wide and 3-in. stroke; a Verson drop brake, 12 ft ide and 3-in. stroke; Cincinnati square shears (open d) 3/16-in. thickness by 12 ft; Niagara square shears, -in. thickness by 12 ft; two Bliss punch presses—one 48 . wide with 6 in. stroke, another 36 in. wide with 2½-. stroke; two Bliss punch presses, 8 in. wide with 2 in. roke; a 12-ft Federal hand brake; an 8 ft Dreis & Krump and brake; a riveting machine, and four floor-mounted rill presses.

The thickness of plywood to be joined to metal sheets this department ranges from ⅛ to 1 in., and metal as eavy as 16-gage, though not standard, can be fabricated.

At times metal sheet to be used, excepting porcelain nameled stock, moves from the shear to the large bend-g brake for edge turning or flanging. This is when the mposite material is to be exposed to extreme moisture. n this case it is important that edges of the panels be ealed. This can be done in any of three ways sketched n Fig. 5. In "A" the end is open, metal faces and plaque eing of equal length. In the "AM" edge, equal lengths f back and facing sheets are allowed to protrude beyond e edge of plywood core and are closed with a sheet-netal lock as shown. The "AO" edge requires a notch wo plies deep to be routed out of the core before the losure shown can be completed. In "FF" a groove is ut at the interface of center plies to permit metal sheet dges to be squared and pressed in. All of these edges an be soldered to seal them completely. In less ex-reme cases, exposed edges are (*Please turn to Page* 98)





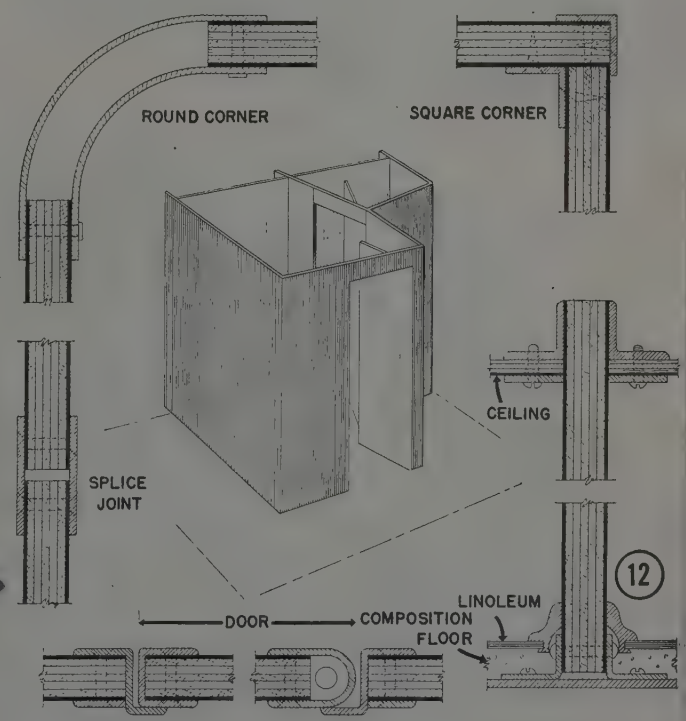


Fig. 9—Finished mold ready for pouring. The casting is fed from the bottom

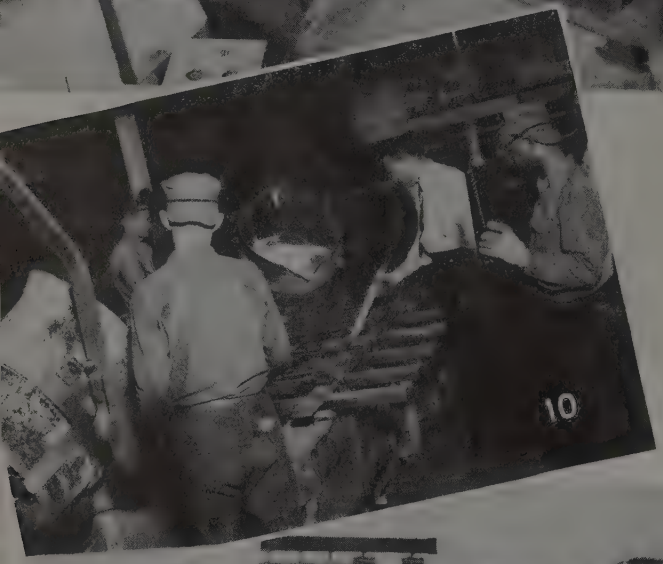


Fig. 10—Large mold being filled by crane ladles. Operator shown with stick is removing slight dross accumulation

Fig. 11—General view of foundry floor. At the rear are two crucible-type melting furnaces. Center foreground shows a mold being poured, to the left a mold is being prepared for pouring, while at the right a reducing flame is being played on a poured mold to retard solidification

Fig. 12—Ferrous insert positioned in mold preparatory to casting. Note six anchor bolts

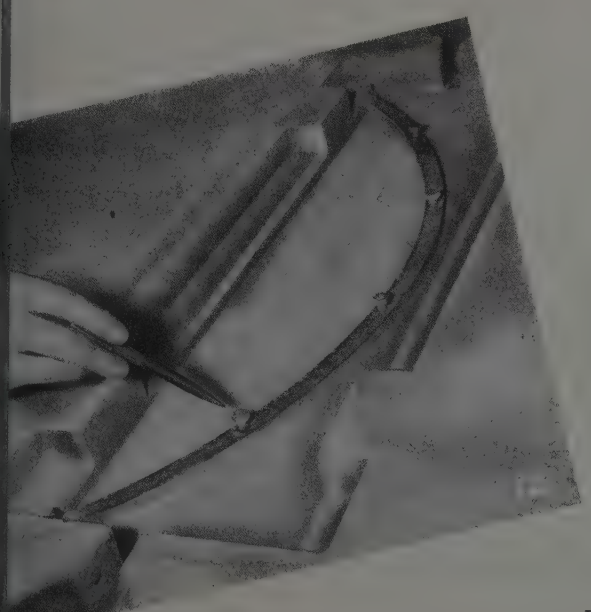
By S. MENTON
Manufacturing Manager
General Motors Overseas Operations
Detroit

Alloy Dies

In this third part of the series on zinc alloy tools, the author discusses foundry practice—production of open molds, sands and binders for molds and cores, pouring techniques and protective measures against warpage

OPEN-MOLD method of casting Kirksite has proved be the most satisfactory way of insuring sound, smooth s. Casting in closed molds has not been attended with ch uniform success. In the latter method, it has been nd that the drag or bottom surface of the casting is ually better than the cope or top side. Some progress s been made with castings for dies having light sections walls by providing adequate mold venting, use of a ge gate through which the metal is poured and a large, gh riser. This method also may be employed in some plications such as the casting of light section parts, jigs d fixtures. So far, however, attempts to cast heavy tion dies in closed molds have not been successful.

In the open-mold method, flask and bottom board rep- sent the most important items of equipment in the olding operations proper, as successful molds depend on eir strength and rigidity. Both wood and steel are used their manufacture and if wood is used it is vital that e sections be of heavy lumber, joints martised, bottom oards reinforced and trussed, and flasks braced by rough-bolts.



Trunnions placed at the center of the flask ends are essential with molds of any appreciable size, both to assist in rolling over and to avoid cracking the mold while turning it over. Steel screw clamps to hold the flask to the bottom boards are much better and safer than "C" clamps and wooden wedges.

In regard to molding sand, authorities agree that in casting the special zinc alloy a fine grain sand with low moisture content is necessary. Beyond this, there seems to be almost as many opinions as there are sands. Another controversial point is the binder or clay content, for while some say that little if any binder is necessary, others advocate up to 30 per cent. With less experienced operators sand with a clay content of from 25 to 30 per cent is preferable. Molding sand grain size should be approximately uniform to avoid packing and afford maximum voids for venting. When the surface tension of the metal is low so that it tends to penetrate the sand, as is the case with Kirksite, a fine sand must be used. Because of its low melting point, the fusing of sand and metal burning is not a problem as it may be with metals cast at a higher temperature. In order to eliminate need of artificial venting, moisture contents of sand should be kept as low as possible.

In molding, the pattern is laid on the bottom board with the contours of the punch or die facing upward. The flask is located to provide a minimum clearance of 3 in. between it and the pattern. Usually, a greater clearance is preferred, not only to prevent the metal running out at the time of pouring, but also to provide space for cutting in the pouring gate.

When the flask has been rammed up to the point that the depth of the sand reaches the uppermost point on the pattern, provision is made for pouring the alloy into the casting cavity by means of a channel or gate through the mold. Only one is required unless there are two deep sections in the pattern which are not connected by a sufficiently large channel through which the metal can flow. In such cases, two openings are provided so that the metal can be poured simultaneously from two ladles.

Pouring sprue is formed by a cylindrical tube or gate pin 1¼-in. ID and of the proper depth located at least 3½-in. from the pattern. A channel or runner of the same diameter is cut into the sand from the sprue opening to the high point on the pattern and covered with a flat baked sand core. This protects the runner from deformation while the remainder of the flask is filled with sand and rammed. No provision need be made for venting except in the case of deep dies. No gases are produced by the alloy but steam from the sand may cause rough spots in the bottom of the deepest dies if not vented.

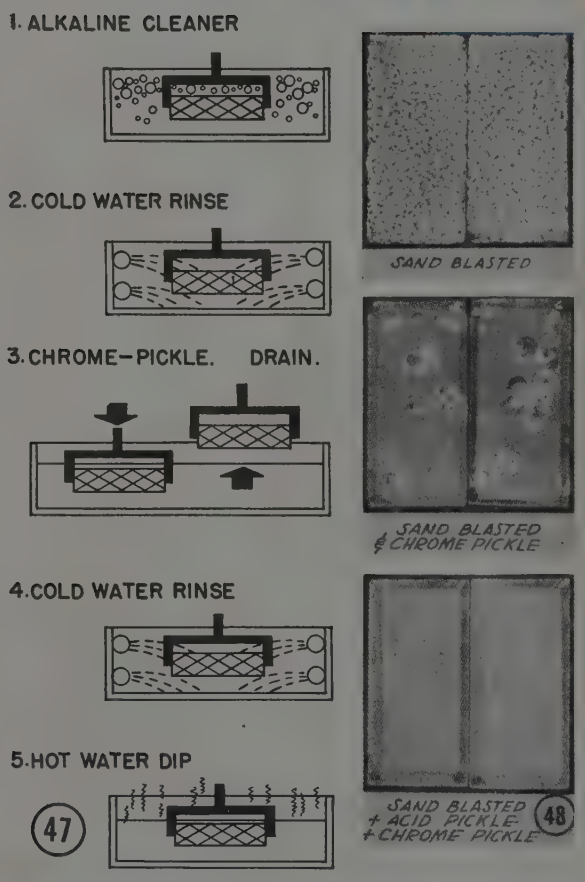
When the mold has been completely rammed up, excess sand is struck off with a straight edge or bar of angle iron, level with the upper edges of the flask walls. A bottom board is clamped in place and the mold is rolled over by hand or by a crane. The clamps and the board which formerly was on the bottom are removed and the flask is leveled up with wooden wedges. Leveling is essential if the correct relation of the casting base to the die contour is to be obtained with a minimum amount of machining.

To provide a head of molten alloy to assure a continuous, even flow into the die cavity, the sprue mouth is enlarged before the pattern is (*Please turn to Page* 109)

By ALLEN G. GRAY
Consulting Editor, STEEL

FINISHING Magnesium

Tenth in the series, this section includes a discussion of various cleaning processes and protective chemical treatments such as chrome-pickle, dichromatic and sealed chrome-pickle methods

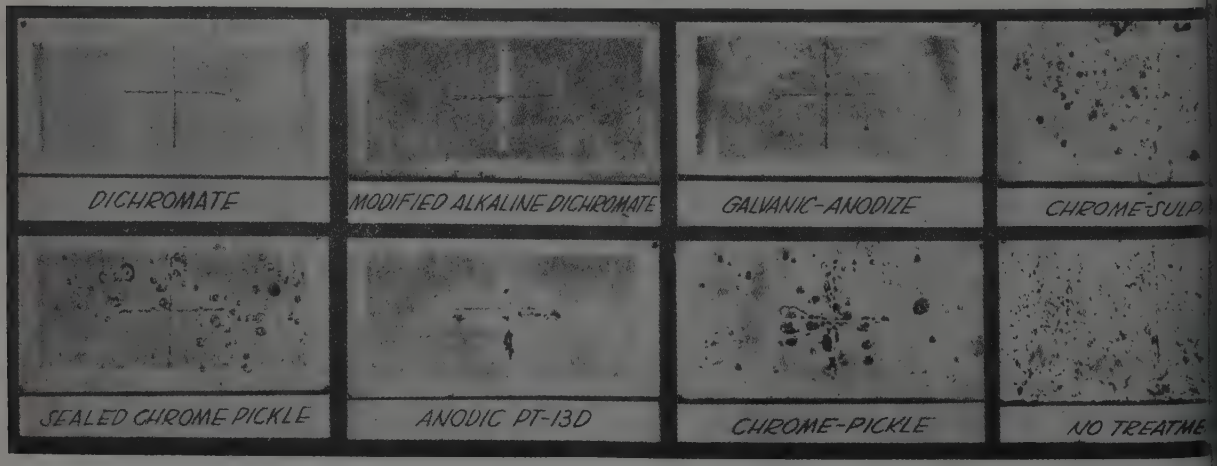


MAGNESIUM, in common with other metals, is subject to corrosion. In general, protective chemical treatments and recommended paint systems are satisfactory for protecting magnesium alloys against the corrosive effects of normal weathering and many corrosive atmospheres.

Chemical treatments provide a passive surface layer with inhibitive characteristics. While most of the treatments do not provide adequate protection in themselves they do afford some resistance to corrosion and serve as paint bases. Suitable paint systems, consisting of one or more coats of primer followed by one or more coats of recommended paint, applied over protective chemical treatments, provide magnesium alloys with adequate surface protection for the majority of uses. Choice of chemical treatment and final protective or decorative finish is determined to a large extent by service requirements and to some extent by the composition of the alloy.

Cleaning: Cleaning is a very important step in the surface processing of magnesium since the effectiveness of subsequent coating processes depends to a marked extent upon removal of all surface contamination. Contaminating substances usually present are oil, grease, dirt, oxide and other foreign materials deposited during fabrication. It also may be necessary to remove previously applied chemical treatments.

Cleaning processes for magnesium may be divided into four general groups: Solvent cleaning, alkaline cleaning, acid pickling, and mechanical cleaning. The choice of a



Alloys

aning method will depend upon the job to be done and uipment available.

Solvent Cleaning: Solvent cleaning by washing or by por degreasing is satisfactory only as a precleaning step here large amounts of oil or grease are to be removed. lorinated solvents, naphtha, and other commonly used aterials can be employed since they exert no harmful tion on magnesium. In general, the same solvent de-easing equipment now used for precleaning other metals satisfactory for magnesium.

An alternative method of precleaning employs an emul-n or emulsifying solvent cleaner. These cleaners are sed on the use of a low cost mineral distillate, such as rosene, and an emulsifier, or oil soluble soap. The ad-tion of the emulsifier to the kerosene improves its pene-ating power and solvent action and makes it immediately

TABLE XXV

EFFECT OF PICKLING ON SANDBLASTED MAGNESIUM ALLOY SURFACES

Treatment	Rating
Sandblast	Poor
Sandblast + Chrome-Pickle	Fair
Sandblast + Acid Pickle + Chrome-Pickle	Good

NOTE: Acid Pickle ..... 15 seconds in 8% HNO_3 + 2% H_2SO_4
Paint Schedule ..... 2 coats Navy P-27 primer
2 coats Navy V-10 varnish + 1.5 lbs per gallon aluminum powder
TEST—1 month alternate immersion in 3% NaCl at 95°F.

TABLE XXVI

CLEANING METHODS USED ON MAGNESIUM ALLOYS

Type of Cleaning	Method of Application	Uses
Solvent	Can be applied by rinsing, by vapor degreasing or as an emulsion type cleaner	Used to remove superfluous amounts of oily matter prior to alkaline cleaning and as a pre-cleaning step prior to painting
Alkaline	Applied in hot solution as a soak cleaner or as an electrolytic cleaner	The most satisfactory method of degreasing magnesium prior to chemical treatment will remove old chemical finishes and thus insure uniform coatings
Chromic Acid Pickle	Applied by immersion in chromic acid solution	Useful for removing oxide, old chemical finish, and forming lubricants which cannot be removed by alkaline cleaning. Oily matter should be removed by solvent or alkaline cleaners before the chromic acid pickle.
Sulphuric	Applied by immersion in a solution of sulphuric acid	Used for removal of oxide and surface contamination from rough parts which will stand dimensional loss. Also used for pickling after sand or shot blasting. A nitric-sulphuric acid mixture is also available for special use.
Mechanical	Applied by wire brushing; sanding; sand, shot and grit blasting	A rapid method of removing heavy layers of oxide and dirt. Sand, shot, and grit blasting should always be followed by the sulphuric acid pickle.

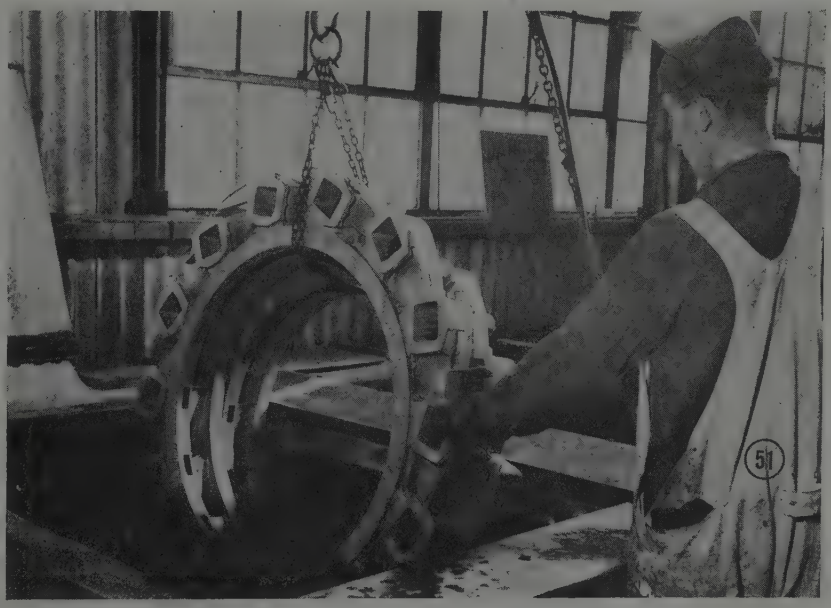
Fig. 47—Diagram of operations for applying chrome-pickle treatment

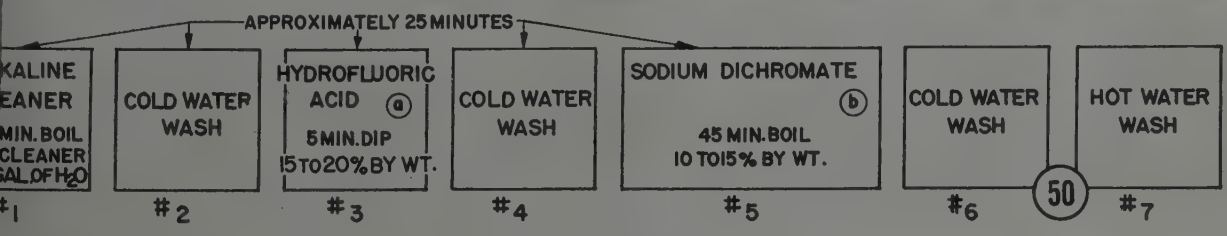
Fig. 48—Effect of acid pickling sand blasted magnesium surfaces. Painted panels after 1 month in salt water test

Fig. 49—Relative comparison of chemical treatments in salt water painted panels

Fig. 50—Arrangement of tanks for applying dichromate process

Fig. 51—Chemically treating a magnesium sand casting





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emulsifiable upon contact with wa... mersion time in cleaners of this type will depend upon the amount of contamination on the work and upon the temperature of operation. The dip ordinarily may be used at room temperature, but penetration is more rapid if the bath is heated to 140-160° F. Three to 5 min usually is sufficient time to allow for solvent to penetrate, after which work should be rinsed in water by dipping or spraying.

Alkaline Cleaning: The precleaning methods described above remove only oil, grease and waxy substances freely soluble in the solvent and therefore will not leave the surface chemically clean. Dirt, lint, metal particles and the like, if present, must be removed by acid pickling, which will be described later. The electrolytic or dip type of alkaline cleaner must follow the precleaning in solvent cleaner. These alkaline type cleaners not only remove any remaining oily matter but also take off the chrome-pickle coating normally present on magnesium castings and wrought forms when they are received from the producer. For best results, the chrome-pickle coating must be removed prior to the application of further chemical treatments on magnesium alloys.

Cleaners of the strongly alkaline type, such as are commonly used on steel, are the most desirable for magnesium. The milder alkaline cleaners needed for aluminum are satisfactory in some cases, although for best results the pH of the cleaning solution should be above 11.

A satisfactory cleaning bath which can be used as a soak cleaner or as an electrolytic cleaner can be made up according to the following formula[17]:

Trisodium phosphate ($Na_3PO_4 \cdot 12H_2O$)	4 oz
Sodium carbonate ($Na_2CO_3 \cdot 10H_2O$)	4 oz
Soap	1.1 oz
Water	to make 1.0 gal.

Soap may be replaced with an equivalent quantity of a suitable wetting agent, its purpose being to facilitate rinsing. The solution preferably is operated at boiling temperature when used as a soak cleaner. It is possible to operate as low as 180° F but some form of agitation should be used at any temperature below the boiling point. The immersion time will depend upon the nature and amount of the oily matter on the surface, but 5 to 15 min usually will suffice. A general rule for acceptable cleanliness is that the surface after cleaning should be free from visible contamination and should be completely wetted by water. A break in the water film indicates insufficient cleaning; the immersion time should be increased.

As an electrolytic cleaner, the bath described above is operateed at 160 to 180° F. No agitation is required, since gas evolution from the surface tends to dislodge oil and dirt physically. If the cleaning bath is to be operated solely as an electrolytic cleaner, the soap is sometimes left out, because there is some evidence that it may collect as a gumming deposit on the anode. To operate, the work becomes the cathode and a direct current of 10 to 20 amp per sq ft of cathode area is applied for 1 to 3 min or longer. Shorter distances between electrodes and higher operating temperatures will increase the cleaning efficiency of the process.

Following either method of alkaline cleaning, the parts should be rinsed in hot water (160° F or higher) and then in cold water. This rinsing must be very thorough to avoid contamination of the chemical treatment baths immediately following the alkaline cleaning. For instance, adherent soap carried over into an acid bath will form an oily layer on the surface of the bath. This film contaminates the work as it is being immersed or removed. In general, steel tanks adequately ventilated are satisfactory for alkaline cleaning solutions.

Previous Articles in Current Magnesium Alloy Series

Date	Page	Subject
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Acid Pickling: Oxide layers, graphite-base drawing and forging lubricants and other water-insoluble or nonemulsifiable substances cannot be removed by solvent or alkaline cleaning. Cleaning in a solution of chromic acid is the preferred method of removing these. Chromic acid does not attack magnesium but readily dissolves the oxide and hydroxide which are ever present, even though very thin, on magnesium surfaces.[18] In the case of die lubricants and other foreign substances, the chromic acid dissolves the thin interfacial layer and then loosens the deposit. Magnesium parts to be cleaned are immersed for 1 to 15 min. in the following bath operated at 190-212° F.

Chromic Acid (CrO_3)	1.5 lb
Water	to make 1 gal

Tap water may be used in making up this bath but the chloride and sulphat... content must be low. Presence of exce... sive amounts of chlorides or sulphate ... the bath causes it to form a coating o... the metal. This reduces the cleanin... action of the bath and the coating ma... interfere with subsequently applie... chemical treatments. Tap water whic... is abnormally high in chloride conte... may be used if a small amount (usuall... 0.1 per cent or less) of silver nitrate ... added to precipitate excess chlorides.

During normal use, control of th... chromic acid may be effected by mai... taining the pH in the range of 0.5 to ... Use of chromic acid solution to remov... flux and corrosion products will ofte... build up chloride, causing the bath ... coat rather than to clean. As pointe... out above, excess chloride can be pre... cipitated with 0.1 per cent silver nitra... solution. Lead lined steel or 2S alum... num tanks may be used for the chrom... acid solution.

Mechanical Cleaning: Oxide, dirt, cas... ing skin and the like may also be re... moved by mechanical methods such ... wire brushing, sanding, sand blastin... grit blasting and shot blasting. San... shot or grit blasting, while very efficie... and economical methods of surface clean... ing, are very undesirable on magnesiu... if maximum resistance to salt water ... salty atmospheres is desired. Surfac... contamination results in accelerated co... rosion[17]. This is clearly shown by th... data in Table XXV and the photograph... in Fig. 48, which show painted test pan... els after one month in the salt water tes... A pickling treatment should always fo... low sand or shot blasting since the re... moval of 0.002-in. or more of metal su... face eliminates the detrimental effect.

A satisfactory pickling procedure co... sists of immersing the parts for 10 to 1... sec at room temperature in a bath co... taining by volume 8 parts of concentrate... nitric acid, 2 parts of concentrated su... phuric acid and 90 parts of water. Th... nitric-sulphuric acid pickle must be ap... plied before any machining since th... amount of metal removed is likely to ex... ceed machined dimensional tolerance... It is quite safe, however, to pickle roug... unmachined castings and heavy section... The nitric-sulphuric pickle may be use... in ceramic, certain types of rubber-line... or aluminum tanks.

Protective Chemical Treatment: Pr... tective chamical treatments provide th... magnesium surface with a passive laye... which resists the attack of corrosive me... dia, in addition to providing a bond fo... subsequent paint coatings. Some pro... tective treatments also have an inhibitiv... character which tends to neutralize co... rosive media in contact with the mag...

(*Please turn to Page* 117)

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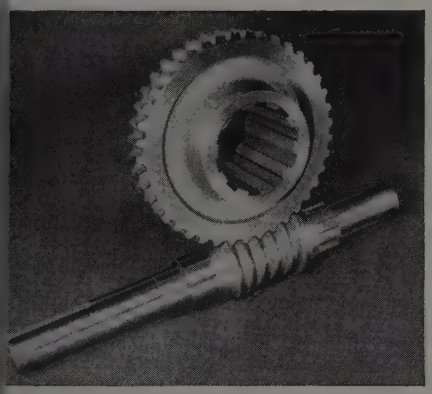

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100	1750	100	1750	100	1750	100	1750	100	1750		100	1750	100	1750	100	1750	100	1750	100	1750
.35	2.96	1.24	9.04	3.00	19.8	6.07	37.0	10.4	59.1	5:1	24.4	119.2	45.8	208.	77.6	336.				
.21	1.95	.75	6.11	1.81	13.4	3.65	24.47	6.35	40.4	10:1	14.7	82.6	28.0	145.	47.1	217.	86.0	410.	133.	632.
.15	1.40	.53	4.39	1.27	9.64	2.58	18.09	4.46	29.1	15:1	10.4	61.2	19.8	105.	33.8	163.	60.5	299.	91.	446.
.11	1.10	.40	3.40	.98	7.5	2.00	13.96	3.39	22.5	20:1	7.92	46.9	15.2	81.6	26.6	131.	45.3	232.	69.	361.
.09	.86	.33	2.77	.79	6.03	1.60	11.2	2.77	18.4	25:1	6.47	38.4	12.3	66.9	21.4	106.	36.6	189.	55.5	296.
.08	.73	.27	2.32	.65	5.06	1.34	9.47	2.32	15.8	30:1	5.42	32.2	10.2	56.0	17.9	89.0	30.0	161.	46.2	248.
.06	.55	.21	1.75	.50	3.79	1.01	7.13	1.75	11.8	40:1	4.1	24.4	7.77	42.4	13.6	67.2	22.2	122.	34.2	186.
		.17	1.40	.39	3.07	.809	5.70	1.40	9.45	50:1	3.28	19.5	6.22	33.9	10.9	53.8	18.0	95.8	27.6	150.
				.33	2.54	.675	4.75	1.17	7.87	60:1	2.74	16.2	5.20	28.7	9.00	45.5	12.7	80.6	21.5	125.
						.58	4.08	1.00	6.75	70:1	2.34	13.9	4.45	24.6	7.72	39.0				

Ratings apply to both Standard Cone-Drive Speed Reducers and Standard Cone-Drive Gear Sets.

Engineering News at a Glance

OVERHEAD WELDING UNITS: In streamlining its production lines recently, Midland Steel Products Co., Cleveland, installed its direct-current arc welders on an elevated platform about 8 ft above the floor level. From the machines the leads are dropped in conduit to a junction box at a central location on the floor of the production line. The welding leads then are radiated wherever they are needed. The usual maze of tangled welding leads is thus eliminated and more floor space for production work is provided. At present, the company's five assembly lines average 20 such arc welding units located on either side of the line.

50,000th MOTOR: Several improvements are incorporated in the 50,000th all steel fabricated fractional horsepower ball bearing electric motor recently turned out by General Die & Stamping Co., New York. It includes specially designed louvers and baffles in the housing which result in low heat rise, and glass insulation to increase its life. For the past 2 years the company has been manufacturing 1/3-hp split phase motors, and in recent weeks has been turning out capacitor start units of the same rating for both 110 and 220 v. It expects eventually to produce a line of motors ranging from 1/8 to 1 hp.

SUPER FLYING BOAT: Six gas-turbine engines of 5000 hp each power the huge 100-passenger SR-45 flying boat now under construction on the Isle of Wight, England. It is being built by Saunders-Roe to meet requirements of the London to New York run, with speed and range to meet continuous 60 mph headwind. The power plants of the plane, together with its contra-rotating propellers, provide a range of 5000 miles in still air and a cruising speed of more than 300 mph. Passengers and pay load will be accommodated on two decks of the 120-ton flying boat. These will be fully pressurized and air conditioned. Wing floats of the craft are designed to retract into the wing section. Also, the plane will be fitted with an automatic mooring device.

FAST DIAMOND DIE DRILLING: Process of drilling small diamond dies, used in drawing and shaping extremely hard and fine wire is reduced by almost 100 man-hours by a new electrical method developed in Washington by National Bureau of Standards. The development, according to the bureau, consists essentially of ten steps that combine electrical with some mechanical drilling. Die blank used in the operation has two plane-parallel faces between which the die is formed, and a side window for viewing the progress of drilling. These are cut on the diamond, using a rotating cast iron lap with diamond powder as an abrasive. Cutting action of the lap is accelerated by application of a high-voltage arc across the face of the diamond being cut. The method, stated to provide better wearing characteristics, requires no special skills or long training on the part of operators. Equipment is inexpensive and drilling technique is simple, the bureau reports.

PROVIDES CUTTING SPEEDS: Speeds and feeds for all common machining operations on eight types of Enduro stainless steels are provided on a circular cutting speed and feed selector being distributed by Republic Steel Corp., Cleveland. It includes form cutting, milling, drilling, and other operations usually performed on an automatic. Conversions of surface cutting speeds to spindle speeds for stock 0.1 to 8-in. diameter also can be made with the device, which was designed from data developed in the machining laboratory of the company's Union Drawn Steel Division.

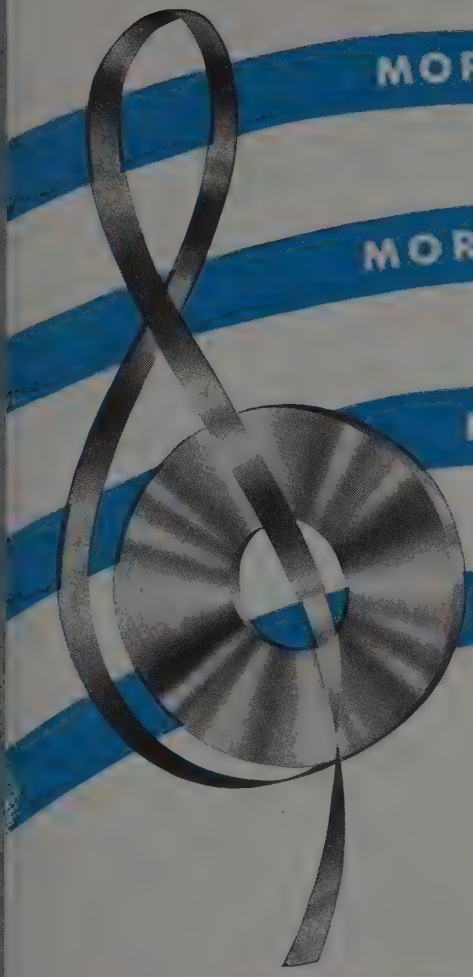
CUTS INSTALLATION COSTS: Designed for gas transmission and natural gas processing industries, the huge new gas engine-driven angle compressor currently under construction in the Mt. Vernon, O. plant of Cooper-Bessemer Corp., is estimated to save users installation costs ranging from $6 to $12 per horsepower. With an 18-in. bore and 20-in. stroke it is rated 240 hp per cylinder at a speed of 250 rpm. In addition, the unit is designed to perform equally well as a gas or diesel power engine or as a gas engine-driven compressor. About five of the units have been ordered by Panhandle Eastern Pipeline Co. to meet unprecedented demands for natural gas in the Eastern and Mid-Western industrial areas.

FIRE FIGHTING WEAPON: Capable of carrying 200 lb of saturated steam at 388° F for more than 300 hours under continuous flexing, a new glass fiber industrial type hose, developed by Goodyear Tire & Rubber Co., Akron, is said to make a better weapon for fighting stubborn refinery and oil well fires. It provides a greatly increased volume of live steam in smothering oil fires such as recently devastated Texas City. Designed also for heavy-duty steam or hydraulic service in foundries and steel mills, the hose employs spun glass yarn supplied by Owens-Corning Fiberglass Corp., as a basic component to gain maximum heat resistance. Bonding technique developed by Goodyear during the war is used to achieve high adhesive strength between the glass carcass, rubber tube and cover of the hose.

RECORDED FORGING ACTIONS: In Germany, investigations for the Office of Technical Services, Washington, found one 15,000 ton forging press at the Krupp works was fitted with a specially-designed recording instrument which recorded the vibrations of the column of the press to indicate overstrain or potential breakdown. At another plant, they discovered the forge manager's office had a remote recording apparatus for each of its three forging presses. These were electrically-operated by the stroke action of the press, and provided an accurate record of forging operations. It also served to check time wastage, since it tabulated idle press time.

DOES FAST STRIP JOB: Enamel insulation is removed from coil wires quickly and cleanly by the Lighting Division of Westinghouse by using a piece of equipment primarily made for brazing and silver soldering operations. During the terminal tinning process, a Gasfluxer unit, made by Gasflux Co. of Mansfield, O., is connected into the fuel gas line supplying the gas to the torch used in the work. The unit is filled with properly compounded fluxing ingredients carried in solution in a highly volatile and inflammable liquid. The fuel, passing through the apparatus, picks up the flux in vapor form and delivers it to the torch. Function of the flux-bearing flame in the stripping operation is to remove the enamel from the wire and leave the end clean prior to tinning.

FAST TRAVELING PUMPS: Pumps that may permit rocket speeds of 4000 mph are being custom made by Pesco Products Division, Borg-Warner Corp., it was revealed in Cleveland. According to the company, its engineers are now concentrating on turning out pumps for all rocket propulsion and ram-jet projects at present underway in the United States. So far, three special types have been developed. The company recently produced a pressure-loaded gear pump for turbo-jet missles that enables the latter to operate on gasoline with any lubricant. For ram-jets, Pesco developed an ultra high-speed centrifugal unit that permits large flows under moderate pressure. The rocket pump produced is especially designed for pumping liquid oxygen, hydrogen peroxide and alcohol.



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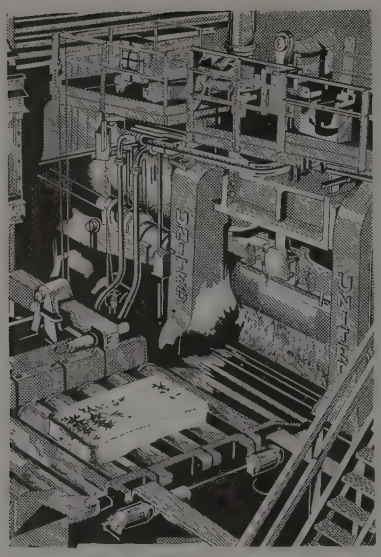

Engineers Present Data on

Rolling Mill Practice

REGISTRATION at the spring meeting of the Association of Iron and Steel Engineers, Benjamin Franklin hotel, Philadelphia, May 26-27, topped 500. Technical sessions held Monday morning and afternoon were well attended; Tuesday was devoted to an inspection of the Lukens Steel Co.'s plant at Coatesville, Pa. A resume of the address of R. W. Wolcott, principal speaker at the banquet, and president, Lukens Steel Co., was presented in last week's issue, page 74. A digest of technical papers follows:

Mill Spindles and Couplings, by W. L. Stover, mechanical engineer, Mesta Machine Co., Pittsburgh: One of the advantages of the muff coupling and spindles is their simplicity. They are cast steel, of 0.35 to 0.45 per cent carbon with 70,000 psi ultimate strength. The outside diameter of the coupling box should be about 1.5 times the diameter of the spindle.

An angle of 10 degrees under moderate loads or 5 degrees or less for heavy loads is considered the best operating conditions.

For modern-slabbing-blooming mill service about 10 degrees is the maximum allowable angle of inclination of mill spindle; spindle length is about 27 ft between centers of bearing segment.

Universal coupling is most generally used, where applicable, on all types of modern mills. Lubrication, however, requires development as does adequate dirt protection.

Rolling Hexagons and Octagons, by C. P. Hammond, rolling mill superintendent Atlas Steels Ltd., Welland, Ont.: Hexagon section is easily held in position by guides because of the flat planes and corners which contact the rolls and they, in turn, tend to hold the bar in position without excessive wear on the guides.

Producing a hexagon section is less difficult to roll than a round, since the flat surfaces and corners tend to assist in holding the bar in the pass. Should the bar be leaning when entering the finishing pass, when using the flat down method, it is necessary to line the entry guides to correct this condition, using the same general procedure as when rolling rounds.

Procedure for rolling the octagon is about the same as for a round. In producing this section special care must be exercised as follows: Rolls must be kept properly aligned on the lead passes. finishing entry guide assembly should be set up accurately and guide manipulation requires the same close attention during rolling as when producing a round.

The guide assembly should be set up with the same precision methods as with guide rounds. The guides should be made of chilled iron, or special alloy material with grooves ground to a set bar in pairs and the base ground square to effect a perfect alignment.

Rolling procedures and principles which are fundamental will continue to be applied regardless of modernization of mills and auxiliary equipment. The roller is being assisted in producing greater tonnage and improved quality by modern mill design with their bearing and guides and by roll designers.

Bearing Construction and Performance, by E. Crankshaw, assistant chief engineer and K. Scheucher, assistant chief product engineer, Cleveland Graphite Bronze Co., Cleveland: A greater thickness of bearing material than 1/32-in. rarely is specified in present day designs. This practice has eliminated the possibility of plastic flow and resulting failure.

Bronze, copper leaded bronze, cadmium nickel, cadmium silver and aluminum all have greater fatigue strength than the lead and tin base.

Hardness of the bearing metal is not a prime factor in realizing satisfactory service under high load, high speed, and shock encountered in applications such as rolling mills. Rather proper choice of bearing materials with their controlled thinness results in satisfactory fatigue as well as superior surface action under full fluid lubrication.

With the adoption of the copper-lead material it has been the practice to hea treat the journal to a hardness of 500 550 brinell. With trimetal bearing consisting of steel background, an interme diate layer of copper-lead and a surface layer of trinary plate of lead-tin-copper it has been possible to use a shaft hardness of 235-285 brinell. However, the harder the shaft the greater will be the factor of safety for minimum wear, and the less danger of seizure as a result of off-conditions of assembly or operation.

Importance of wall thickness on the final quality of bearings and its performance cannot be stressed too strongly as the tendency has been, and still is, to keep the wall thickness excessively heavy This is definitely a holdover from the days of puddling babbitt and then scraping the bearing in place.

Recent developments indicate tha some of the copper-lead alloys can be cast centrifugally under carefully controlled conditions. Experience indicates that neither oxidation nor rust inhibitors have a deleterious effect on the common bearing alloys. Use of thinner wall bearings permits the housing to master the bearing rather than the reverse.

It is believed that many of the experiences and recent developments pertaining to bearings in the internal combustion field will in the near future be successfully adapted to the bearing practice in the heavy machinery industry.

Resistance Welding, by O. H. Griffith welding engineer, Federal Machine & Welder Co., Warren, O.: A recent application of the spot welder uses two movable spot welding heads on a traveling carriage. It is employed in the stainless steel annealing lines. By far the most practical type of welding machine for joining the ends of strip steel by the

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lap method, is the traveling head series seam welding machine.

Where the strip is to be processed by the cold roll method, it is necessary to weld the two ends of strip by flash-butt weld method. For comparatively light gage stock and narrow width of strip, a standard design flash welding machine can be used. These usually ride on steel tracks so that the machine can move into the strip line to make the weld and then return out of the line while the strip continues through the various processes.

While the use of resistance welding in the strip industry is confined primarily at present to mild steel, stainless steel and to some extent silicon steel, it is hoped it will be ued in the manufacture of special alloy steels.

Slab Heating Furnaces, by C. E. Duffy, assistant fuel engineer, Bethlehem Steel Co., Sparrows Point, Md.:

Four 18 x 80-foot triple zone continuous slab heating furnaces serve the 56-in. hot strip mill at Bethlehem's Sparrows Point plant.

In 1937 when three of the furnaces were installed the control equipment and instruments were installed in individual control houses, located between the furnaces. This proved unsatisfactory inasmuch as the operator had to walk from one to the other to observe conditions for the various zones on the three furnaces. The area between the furnaces was too warm for efficient operation and maintenance of instruments and controls.

When the fourth furnace was installed in 1945 the instruments and controls were moved to a central control house some distance from the furnaces.

Relocation of the equipment and addition of zone temperature control afforded the following advantages:

1. Heater is able to check quickly all furnace conditions from one central station.
2. Regular and even heating.
3. Prevents occasional overheating and a build up of scale on the hearth.
4. Improved operation of controls and instruments.
5. Simplified maintenance problem.

Rolling Practice, by R. F. Lavette, superintendent 44, 36 and 22-Inch mills, Republic Steel Corp., Chicago: Cutting and handling of test pieces of alloy and other quality steel usually is important. At the 44-in. mill the test pieces are handled by a motor-operated retractable chute mounted on rollers on an inclined ways through an opening in the side of the shear frame and actuated by the rack and pinion.

In getting a test, the shear depressing table is retracted and the chutes moved through the opening in the shear frame until directly beneath the piece to be cut. The test piece falls into the chute and slides down to a flight conveyor which delivers it to the test room opposite the shear. As soon as the test has dropped from the shear the chute is withdrawn and the tilting table is run back and shearing is resumed, resulting in a minimum of time required to secure the tests.

Practically all products rolled on the 32-in. mill is stamped with the ingot number, heat number and cut number on each bar. This is accomplished by placing a holder containing all the necessary stamps against the stop at the end of the saw runout table, and permitting the hot bar to strike against the holder, the impact making a clear and legible impression.

A reciprocating dog-type fast transfer bed has been provided for the fast handling of critical alloy items to the slow cooling pits while still hot, to prevent flaking or rupturing.

A continuous 8-stand, 21-in. billet mill is being installed with the existing three mills to supply 2 3/16 and 3-in. rerolling billets to the 10-in. bar and rod mills.

Wrought Steel Wheels, by W. A. Ashton, superintendent Wheel and Axle Division, and R. N. Merk, assistant to chief engineer, Carnegie-Illinois Steel Corp., Munhall, Pa.: One of the most recent developments in water conditioning art is the demineralizing plant for the removal of all ionized materials. While it involves a chemical cost higher than either the precipitation or zeolite type softeners, it is more economical than distillation.

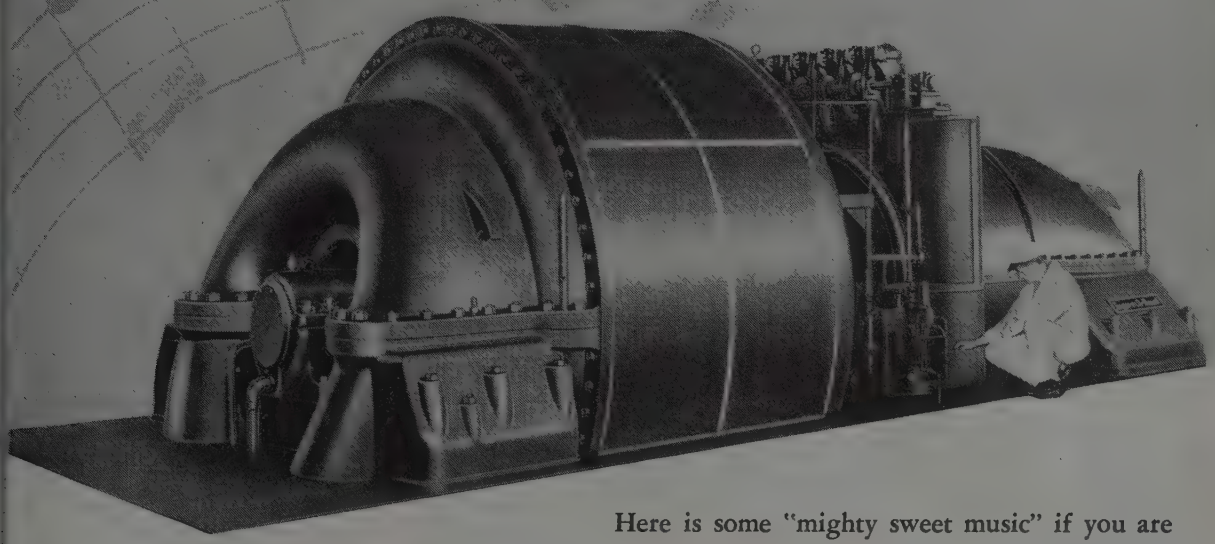
Since the process does not remove silica, this constituent becomes of extreme importance because the water is low in total solids, permitting low blowdown, so that even small quantities of silica in raw water may accumulate to relatively large quantities in the boiler concentrates. Therefore, the demineralizing process must be supplemented by a silica removal either by adsorption using magnesium oxide and caustic soda, or by treatment with hydrofluoric acid or its equivalent and subsequent ion exchange.

Reducing Metal Wear Subject of Paper

A survey of steels and cast irons possessing special merit as wear-resisting materials, was the subject of a paper delivered before the 49th annual meeting of the American Ceramic Society in Atlantic City, by J. S. Vanick, metallurgist, associated with the Development and Research Division of Internatioona Nickel Co. Inc., New York.

Pointing out the manner in which one industry borrows experience from another, he cited the case of the mining industry where records of achievement in abrasion resistance for the hardest of chilled irons led to the application of his company's Ni-Hard in the ceramic industry for muller tires, scrapers, knives and augers.

A Blower Record that "Plays Your Tune"



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One of our 11,000 hp turbo-blowers was recently opened for inspection after six years of continuous service...and it was in *perfect* condition! This means that the original low Power consumption was not affected by use—Maintenance cost was nil —Availability was 100%.

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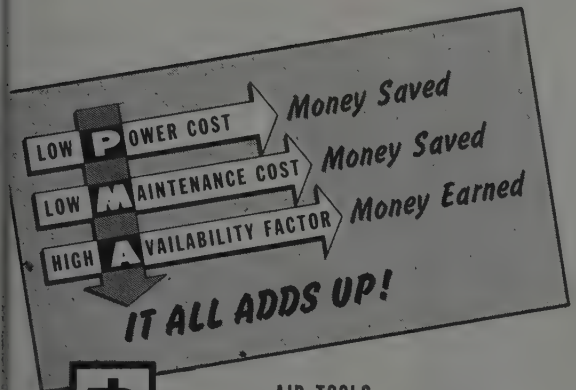

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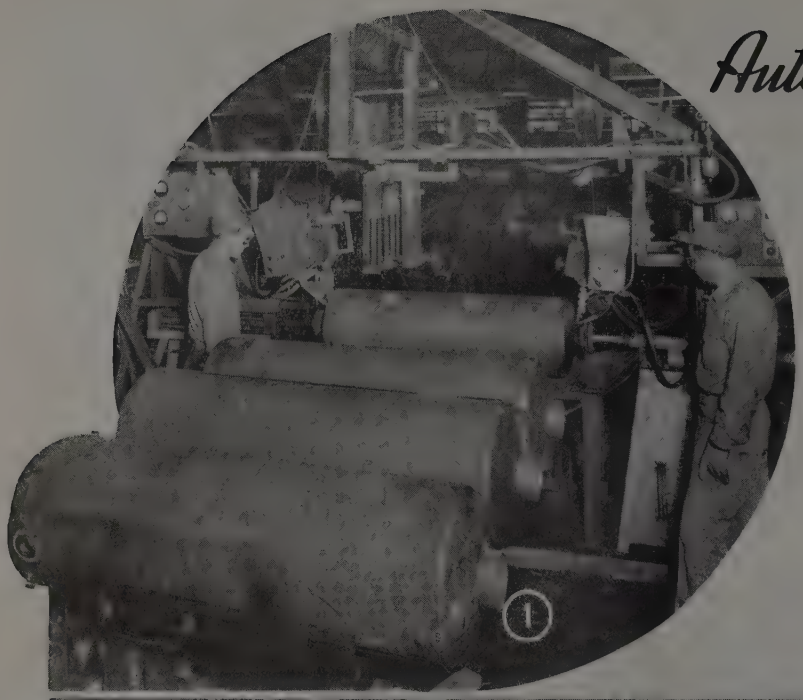
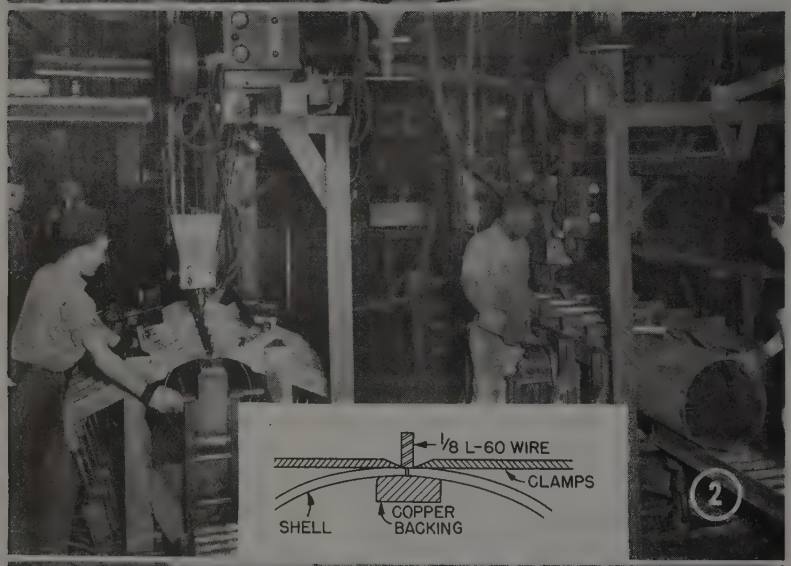
Automatic Metallic Arc Welding Hot Water Tanks



SYSTEMATIC adherence to manufacturing details is evident everywhere at the Detroit plant of Ferro Stamping & Mfg. Co., one of the nation's largest producers of hot water tanks. Until a year ago the company had confined its productive efforts principally to stamping automotive parts. Recognizing the accumulated postwar demand, the management began early in 1946 to plan for the fabrication of hot water tanks by automatic metallic arc welding.

Users' reliance on the safety of tanks imposes great responsibility on a manufacturer, since the slightest inattention to details can have disastrous results. In general, the following steps are taken in processing a typical hot water tank: The raw stock is sheared to size and the spud holes are pierced. The shell is then rolled, degreased and welded along the longitudinal seam. All tanks, regardless of gages (11 to 14) of steel are butt welded against copper backing along the longitudinal seam, Fig. 2.



The inset in Fig. 2 illustrates the positioning and the welding technique. A 2-stake type fixture is used, requiring a three-man team—one operator and two helpers or setup men. The operator jockeys between the two fixtures following the insertion of the tank. Two heads operate from one 1200-amp welder, each fixture having a tumbler switch closing and opening the circuit for each head.

Production on the longitudinal seam welding of the shells has been stepped up to approximately 40 per hour. The links and thermo clips are mounted by

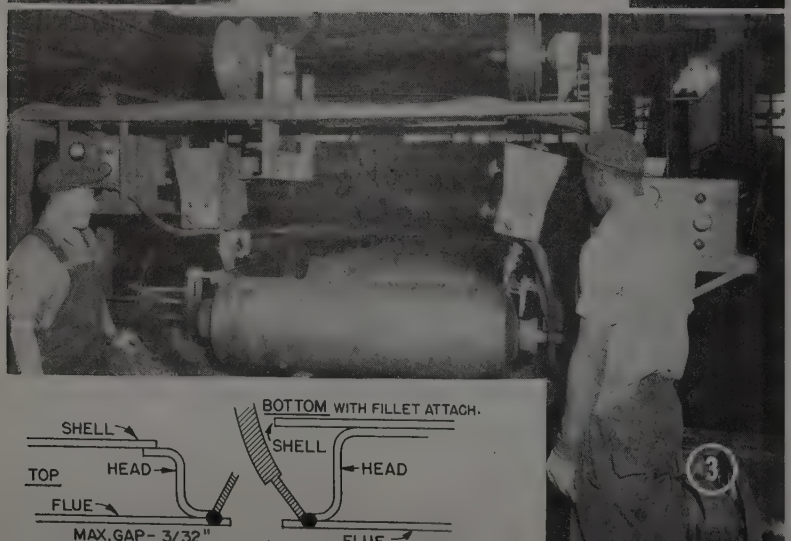


Fig. 1—Simultaneous welding of flues is conducted on assembly line basis

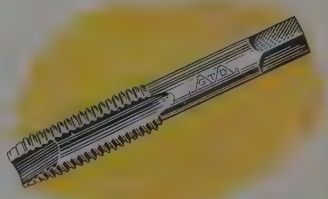
Fig. 2—Two setups for butt welding tanks against copper backing along longitudinal seams

Fig. 3—Both heads are welded simultaneously to shell

This town became world famous..

Greenfield, Massachusetts, is just as beautiful today with its elm-shaded streets and colonial homes as it was 75 years ago. But during those years it has become world famous as the home of fine threading tools. These GTD "Greenfield" tools are used in every part of the world where metal working is done. They have played a key role in the Machine Age that has freed mankind from drudgery. The modern American threading tool industry was born in Greenfield in 1872 with an idea for a better die. The chief industry of this little town in Pioneer Valley has never ceased pioneering in its field to this day. Wherever threading tools are used, the name GTD "Greenfield" stands for quality.

A major pioneering feat in internal threading was the development by GTD "Greenfield" of the "Gun" Tap. It is made with fewer flutes and a spiral point which causes the tap to cut a curling chip that is "shot" ahead. The design produced a stronger tap and eliminated the tendency of chips to clog the flutes, a principal cause of tap breakage, and stepped up production standards.



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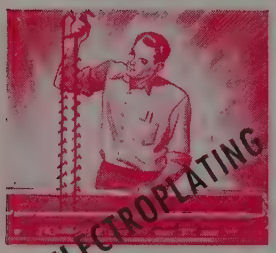

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Ammonium Thiosulfate Solution
Aqua Ammonia
Chromium Fluoride
Fluoboric Acid
Hydrofluoric Acid
Hydrogen Peroxide
Metal Fluoborate Solutions
Muriatic Acid
Nitric Acid
Potash Alum
Potassium Cyanide
Sodium Fluoride
Sodium Metasilicate
Stannous Chloride
Sulfuric Acid
Tetrasodium Pyrophosphate
Trisodium Phosphate

Rimming Steel Manufacture

Sodium Fluoride

Steel Manufacture

Sodium Bisulfite, Anhydrous
Sodium Sulfite, Anhydrous
Sulfur
Iron Sulfide

Descaling

Glauber's Salt
Sulfuric Acid

Acetic Acid
Hydrofluoric Acid
Muriatic Acid (Hydrochloric)
Nitric Acid
Sulfuric Acid
Nitre Cake
Sodium Fluoride
Sodium Bifluoride

Casting

Ammonium Fluoborate
Potassium Fluoborate
Sodium Fluoborate

Barium Fluoride
Sodium Fluoride
Potassium Fluoride
Potassium Cyanide

Electrolytic Polishing

Acetic Acid
Perchloric Acid
Sulfuric Acid
Hydrofluoric Acid

Bright Dipping

Hydrofluoric Acid
Nitric Acid
Sulfuric Acid
Muriatic Acid (Hydrochloric)

Oxide Finishing

Copper Sulfate
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Nitric Acid
Oxalic Acid
Sodium Silicate
Sulfuric Acid

Galvanizing

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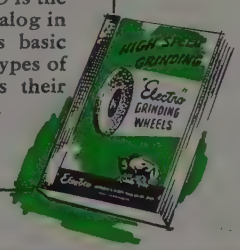

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projection welding, followed by the hand welding of spuds into the tank shell.

Using a hydraulic ram, the top and bottom heads are inserted in the shell and tack welded to locate them. The shell is now ready for the flue which is placed in the tank, tacked and simultaneously welded, as shown in the drawing, Fig. 3, to both the top and bottom heads.

A fillet attachment is used in welding the heads to the flue. Flues may vary in gage from 8 to 11, while the gage of the heads ranges from 7 to 11. The flues are welded simultaneously, Fig. 1. Production on welding flues to heads is held to about 40 per hour in order to avoid upsetting the flow of production. Next, both heads are welded to the shell simultaneously, Fig. 1. The gage of the heads runs from 7 to 11 while shells average between 11 and 14. Tanks are between 14 and 20 in. in diameter while their length will vary from 38 to 60 in.

L-60 electrodes ⅛ in. in diameter are use on all automatic welding, with No. 660 flux. The automatic welding is done with metallic arc equipment furnished by Lincoln Electric Co., Cleveland. When welding is completed, tanks are inspected for leaks before proceeding further. After testing, tanks are ready for pickling, rinsing and fluxing. This is followed by preheating and galvanizing. Spuds are then tapped into the heads and air-tested for leaks.

As a guarantee of safety, finished tanks are tested hydrostatically to insure ability to withstand extreme pressure, before receiving inspection approval. They are then ready for shipping.

To increase tank output, production technique was designed to minimize handling. Roller conveyors are used between each welding setup and also from the last welding operation to the final air check.

Composite Materials

(*Continued from Page* 79)

simply treated with a mastic or properly finished with paint.

Before fabrication, aluminum and stainless steel sheets are washed to remove any foreign matter such as grease, dirt or grime. After washing, the metal is routed to the Plymetl production line. The plywood plaques have also found their way to the line and the marriage of wood and metal is about to take place.

Metal and plywood are placed on a conveyor which passes through a glue spreader. Whereas the all hardwood veneers are bonded with phenolic resin adhesives, this machine employs a special glue formulated at Haskelite for metal to wood bonding. The adhesive is piped from a tank above and flows as long as the machine is in motion. As the metal and plaques pass through the spreader, two spray nozzles working back and forth spray an even coat of glue to the one surface each of metal and plaque.

Following application of the glue, the sheets are placed on a dolly or four wheeled narrow gage truck. The metal facing sheet previously cut to size is first placed on the truck, then a plywood plaque is carefully placed on the metal. If a metal two-side combination is being made up, another sheet of metal is placed on the plaque. This lay-up is continued until a stack is completed. The number of panels in the stack to be glued at one time is determined by the thickness of each panel. The press has a maximum opening of 47 in. and a minimum of 13 in.

The truck is rolled to the press where the operator checks his area chart for suitable pressure for type of panel to be bonded. The factors to be considered are area of panel, area of hydraulic ram and pressure. Requirements of the particular laminate are usually governed by the type of core material.

When it is necessary to extend plywood panels for greater length, as was the case during the war when the plant made panels 80 ft long for landing craft, they are put through a scarfing press. However, this is no longer a standard procedure, panel sizes being limited to standard widths and lengths up to 48 x 144 in.

The comparatively great stiffness of composite panels often makes it possible to reduce the number of fastenings and framing members required. For instance, a ⅜-in. thick EVE panel (zinc-coated steel on two sides of a standard plywood core) weighs 2.56 lb per square foot. Weight of 16-gage steel is 2.5 lb per square foot. Yet resistance of the wood and metal panel to bending is said to be about 75 times as great. Where rigidity is of primary importance, the following is worth noting: A ⅜-in. thick UVU panel (two aluminum facing sheets on a standard plywood core) weighs 1.43 lb per square foot. Weight of 20-gage steel is 1.5 lb per square foot. Though lighter in weight, tests made by the company showed the Plymetl panel to be 100 times as stiff as the sheet steel.

In structural applications it is usually only the edges of the panels that are fastened, and the fastened edges covered with trim or molding. This saves manhours in application. Being very definitely a prefabricated material, the Plymetl composite frequently comes to the job with attachments and accessories in place, for it can be worked at a bench where conditions are ideal and tools are handy.

If these materials are to be fabricated in a customer's shop, simple machinery or hand tools are adequate. Loss of material as a result of processing is minimized, for the panels will withstand ordinary rough handling.

Sawing: Band saw, hand saw, circular or jig saws can be used, depending on the type of metal on face and back of panels and type of cut required. When sawing panels with one steel face, the metal face should always be kept uppermost. For band saws, an 8-ft spring temper metal cutting blade made by American Saw Co., or its equivalent, operated at approximately 11,000 fpm at feed speed of between 30 and 40 fpm is recommended for aluminum, steel or stainless steel faces. Sawing of a large panel is shown in Fig. 6.

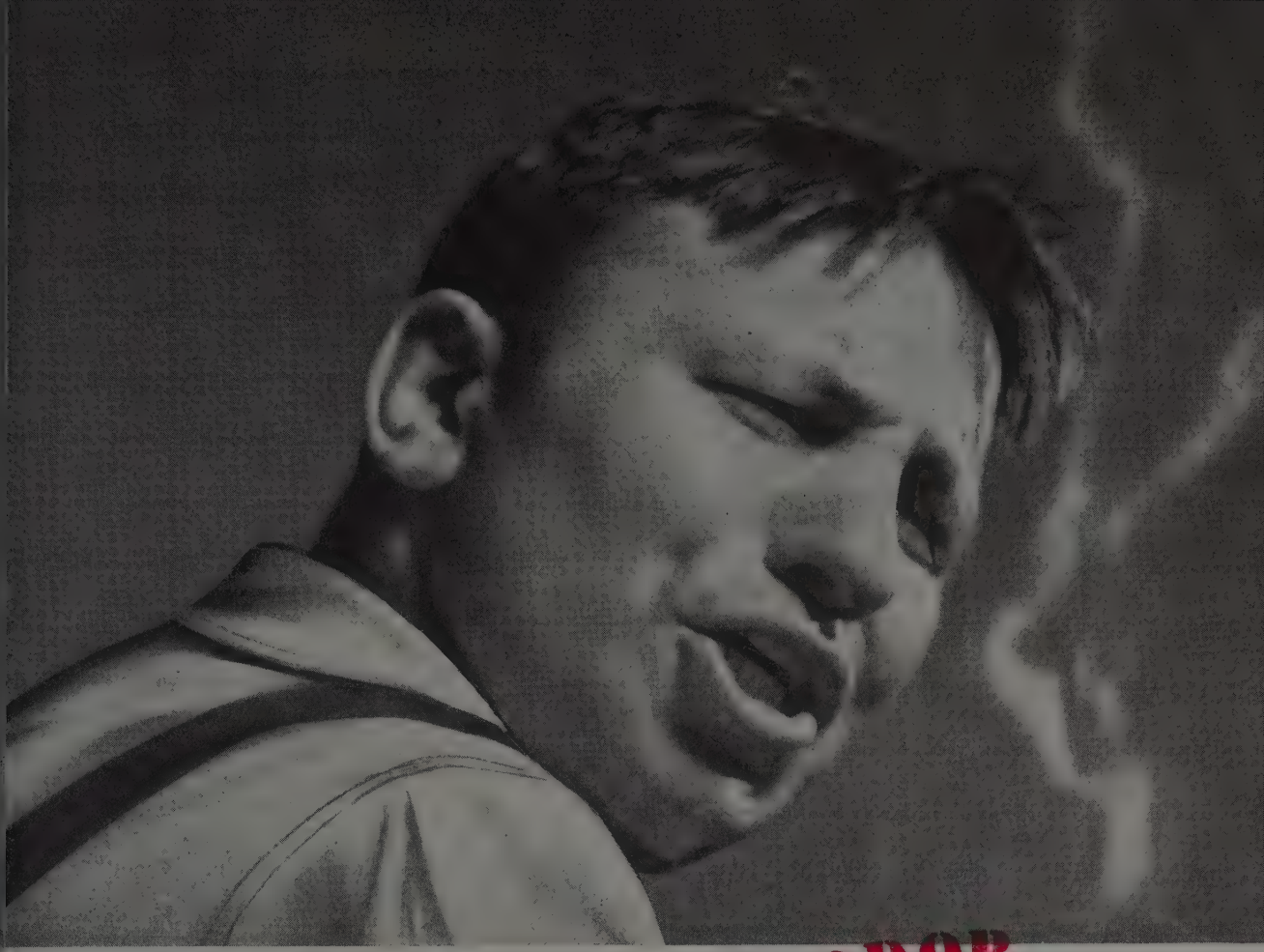
For circular sawing, a 15-in. diameter, 14-gage saw, with 3½ teeth per inch and operated at about 3000 rpm is recommended to cut aluminum-faced panels. A jig saw should be used only on panels with aluminum and steel faces. For this, a blade of Swedish steel not tempered, ¼-in. wide, 19-gage, 7 points, is recommended. Aluminum faced material, of course, can be fabricated with a hand saw, if necessary.

Drilling, Boring, Routing: Aluminum-faced panels can be routed with a two-fluted end mill cutter of about ½-in. diameter. When facing and backing sheets are of any standard metal, they can be drilled with any ordinary metal-cutting twist drills, as shown. For large holes, the tip of the drill may be modified as shown (Fig. 7). This insures a clean hole without burr. Fig. 8 shows type of boring tool suggested.

Right angle corners are formed in panels by routing a V-notch through the plywood to the inside of the metal face. Notched edges of the plywood then are treated with a mastic and the panels bent to make a neat, seamless right-angle corner.

Bending and Forming: Some fabricators have found it practical to do their own bending of metal-wood composite panels to make simple curvatures as in Fig. 9. Simple dies and a hydraulic press are used. Plymetl also may be bent to simple curvatures by passing it between rollers similar to those used by tinners for bending sheet metal. This principle is illustrated in Fig. 10.

When properties of metal are wanted, but the handsome finish and softer effect of wood is demanded, a composite material called Ornametl can be ob-



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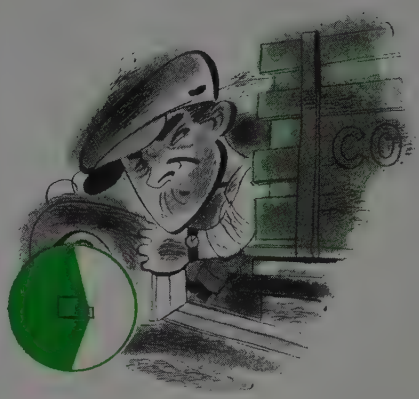
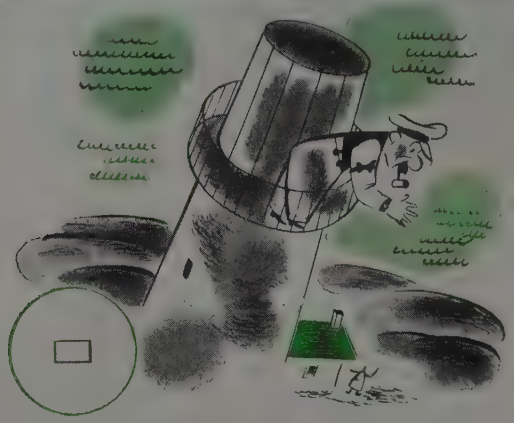


The truck driver has better visibility. He can easily see straight ahead and on both sides. But he has to stretch his neck or use awkward mirrors to see what's going on behind.



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ined. Haskelite has developed this ecialty (See Fig. 11) by bonding a ngle thickness of veneer—mahogany, alnut, birch, etc.—to metal sheets hich, in this case, comprise the backing aterial. This derivative of the proc- ses previously described can also be nt, formed or stamped to almost any ape and is finding an outlet in paneling r architectural designs and of more im- ediate significance, in special automo- ve bodies, station wagons, etc. Some fice furniture and equipment also is ing made from it.

Before standardizing on any form of ese composite products, the company bjects the new composite to thorough sting to determine its reaction to every nceivable contingency and condition hich it might be called upon to with- and the most severe mechanical shocks d stresses, those it could be expected encounter in truck or trailer bodies using and hauling a multiplicity of eavy and often roughly packed articles. erformance of panels under stresses of ear, impact, vibration and bend has en studied and vibration tests to which e material was subjected alone con- itute far greater demands than those years of service.

The very considerable interest of rail- ad designers in these metal-to-wood minates made it necessary for the com- any to compile in a book exclusively r railway equipment builders all data lating to car sections, their fabrication d installation. Here are to be found l standard sections and panel edges. luminum extrusions for joining flat anels are described. Also included are any sketches of recommended designs r exterior and interior doors, partitions, ulkheads, trim and finish sheets, as ell as construction details covering such cilities as washrooms, etc. Some of the any assembly methods available and pes of fasteners used can be see in ig. 12.

To dispel all doubts over the ability f this material to take its full share of he "beating" usually given structural embers of railway rolling stock while perating at high speeds over none too mooth roadbeds, Haskelite engineers de- ised a modified torsion test for a Ply- netl partition assembly which approxi- nated conditions to be met.

In this test, three UVU (aluminum- lywood-aluminum) panels, 36 x 72 in., vere joined together by means of alu- ninum extrusions and bolted at extreme nds to facing angles mounted on 2-in. vide beams, one each at top and bottom f the wall section. Top beam was rigid- y held; end of lower beam was pivoted. The complete assembly was subjected to twisting action probably more severe han any comparable result in service. Maximum amplitude at moving corner was 2 in. About 225,000 oscillations were recorded, the test lasting for 140 hours. At the end of this period there was no apparent damage to panels or joints. One portion of the assembly, including an extrusion, was painted. At completion of test, this painted portion showed no visible evidence of checking or crazing and at no time did creaks or noises develop from the movement of the assembly.

Present Uses: Present uses of composite metal and plywood panels include railway car bulkheads, partitions, interior doors, luggage shelves, table tops and cabinets; diesel locomotive doors and exterior sheathing; truck and trailer side panels, partitions and liners on insulated bodies, truck doors and roof panels; street car and bus doors, luggage racks; storage equipment doors, gas-tight doors, quarantine cabinets; instrument boxes and cabinets; door panels for cotton processing machinery; factory truck platforms; elevator cabs and escalator side panels; soda fountain cabinets; and in much bakery equipment.

Polishing and Lapping Electrolyte Recommended

In the table accompanying the article "Electrolytic Polishing and Lapping", STEEL, May 19, p. 86, the electrolyte composition for both 70/30 and 60/40 brass should be 95 H_3PO_4, 5H_2SO_4. Joseph Mazia, the author, now is associated as metallurgist with American Chemical Paint Co., Ambler, Pa. He was formerly associate metallurgist at Frankford Arsenal, Philadelphia.

Mexican Industrial Directory Published

First industrial directory of Mexico ever printed in that country is now available. Sponsored by the Confederation of Industrial Chambers of Mexico, an organization similar to the American Manufacturers Association, it lists all Mexican industrial companies, their addresses, names of key personnel, including raw materials used by each company, products manufactured, capitalization and number of workers.

According to the issue source, Publicaciones Rolland, S. de R. L., Mexico, D. F., a special Spanish-English dictionary is included with 1024-page volume.

Electric Salt Bath Heat Treating Booklet Offered

Subject of electric salt bath heat treating and processing is covered in the 72-page, booklet published by Ajax Electric Co. Inc of Philadelphia. It explains general advantages of this method of treating, detailing of the electrodynamic self-circulating principle of the Ajax-Hultgren furnace.

Additional sections are devoted to salt bath heat treating operations and processes, some of which are: Neutral hardening, liquid carburizing, cyanide hardening, heat treating aluminum, annealing, dip brazing and tempering and coloring. Requests for the booklet, designated as No. 116, should be sent directly to the company on a business letterhead.

NEW LITERATURE

GASWELD WELDING AND CUTTING EQUIPMENT AND SUPPLIES
By Liquid Carbonic Corp., 1454 West Randolph street, Chicago 7. Revised catalog features welding and cutting torches, single stage regulators, welding and cutting outfits and a variety of special purpose torches, tools and accessories.

PROFIT INSURANCE
By R. G. LeTourneau Inc., Peoria, Ill. Form No. TP-130, a 12-page booklet, contains photographs taken on typical Tournapull jobs in general construction, industrial, railroad, mining, pit and quarry and export fields.

ARC WELDERS
By Hobart Brothers Co., Box DM-742, Troy, O. Folder illustrates and describes gasoline engine drive arc welders.

CENTRI-MERGE SPRAY BOOTHS
By Schmieg Industries Inc., 330 Piquette avenue, Detroit 2. An 8-page folder illustrating and describing the spray booths.

CARBIDE TIPPED STANDARD TOOLS
By Super Tool Co., 21650 Hoover road, Detroit 13. Catalog No. 47 covers a complete line of standard carbide tipped cutting tools including tool bits, reamers, centers, milling cutters, saws, counterbores, core drills, straight flute drills, masonry drills, twist drills and engineering data.

ELECTRIC FURNACE
By Thermo Electric Mfg. Co., 480 West Locust street, Dubuque, Iowa. Four single-sheets illustrating and describing models GTP, OFE, GRP, and CEA electric furnaces.

INDUSTRIAL PRODUCTS
By Imperial Brass Mfg. Co., 1200 West Harrison street, Chicago 7. A 74-page booklet describing and illustrating all the company's products.

FORMULA A-N-I
By Benson Laboratories Inc., Bessemer Building, Pittsburgh. Folder describes the formula which is for treatment of certain symptoms of the common cold and helps reduce employee absences.

TEMPLATE CATALOGS OF PARTS
By Jergens Tool Specialty Co., Cleveland. Catalog No. S-1 covers the use of Seal-Peel in parts merchandising.

SINGLE CIRCUIT BATTERY CHARGER
By Electric Products Co., 1725 Clarkstone road, Cleveland 12. Bulletin 210 describes and illustrates the new single circuit battery charger.

Blast Furnac

HIG

CHANGES required in blast furnace construction to permit furnace to be operated under high pressure are comparatively minor. In addition, the alterations are low cost (provided proper blowing equipment is available), totalling from $70,000 to $150,000 depending on the furnace. The construction changes made are noted in Fig. 3. They consist of the following.

1. A one-piece hopper to insure a tight seat for the big bell. At the Cleveland No. 5 furnace the contacting surfaces of the bell and hopper are hard-surfaced. At Youngstown a standard bell and one-piece hopper are being used.
2. Equalizer valves operated to equalize the furnace and between-bell pressures when the big bell is dumped. Two systems are in use, that at Youngstown employing clean furnace gas from the wet washer for equalizing, and that at Cleveland utilizing dirty gas from the furnace.
3. Wet washer level, hand-operated control to prevent blowing of washer seal.
4. Throttling valve to regulate top pressure.

In addition, there are other lesser changes such as more hold-down rollers and extra weights on the McKee top and superior packing for the gage rod. Electrically operated, positively-seated bleeders are used on both furnaces.

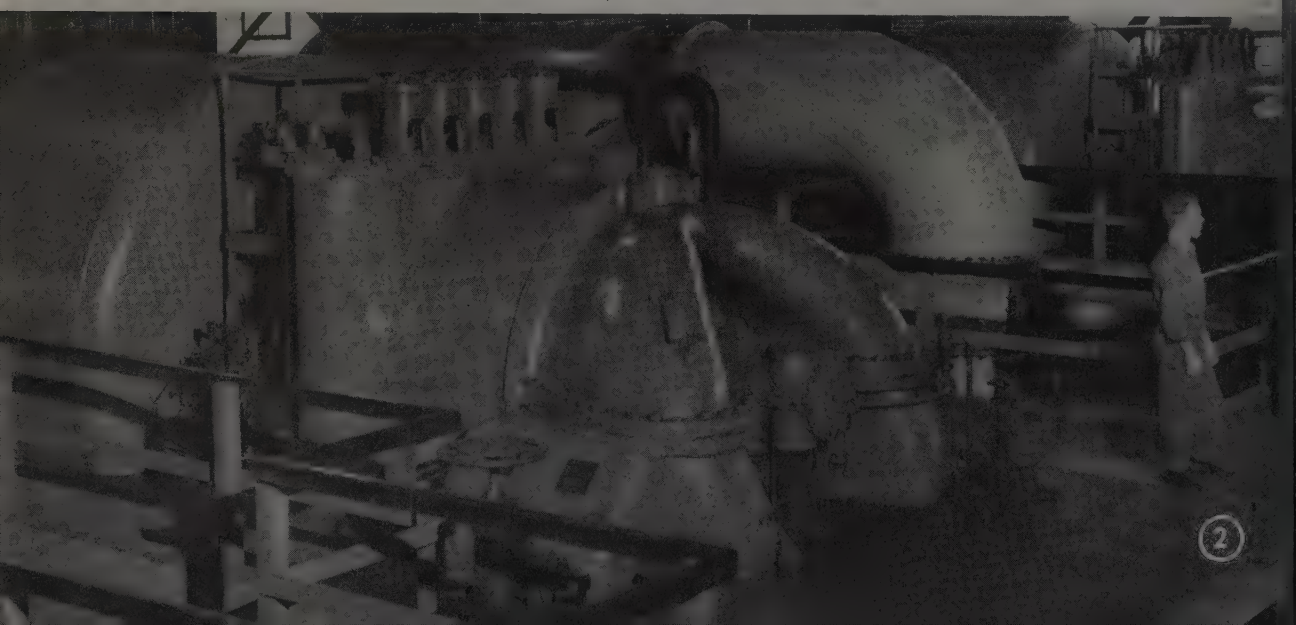
No alterations are required on the cast house floor. However, a long trough is recommended so that proper slag metal separation can be obtained under the faster casting conditions existing.

Blowers utilized should be capable of blowing at higher pressures, a minimum of approximately 6 to 8 lb above those normally used, at the same wind volume. In order to obtain the greatest return from pressure blowing, the blower should also be capable of delivering substantially larger than normal volume of air per minute to the furnace.

To operate the furnace under increased pressure, one merely regulates the throttling valve to control the top pressure of the furnace at the desired level. Hand settings and automatic control on the throttling valve maintain the top pressure remarkably constant, except during checking. The turboblower is then adjusted to blow the desired amount of wind at the increased blast pressure desired. Thus the average static pressure in the furnace can be considerably increased.

The dry coke rate at Youngstown has decreased from approximately 1705 (normal operation) to 1485 at 10 to 11 psi top pressure, a saving of 220 lb per ton. At Cleveland the coke rate, omitting the strike periods, decreased from approximately 1750 (normal operation

Fig. 1—No. 5 furnace, Republic Steel Corp., Cleveland
Fig. 2—Ingersoll-Rand turboblowers which provide blast for No. 5 stack



Practice Under PRESSURE OPERATION

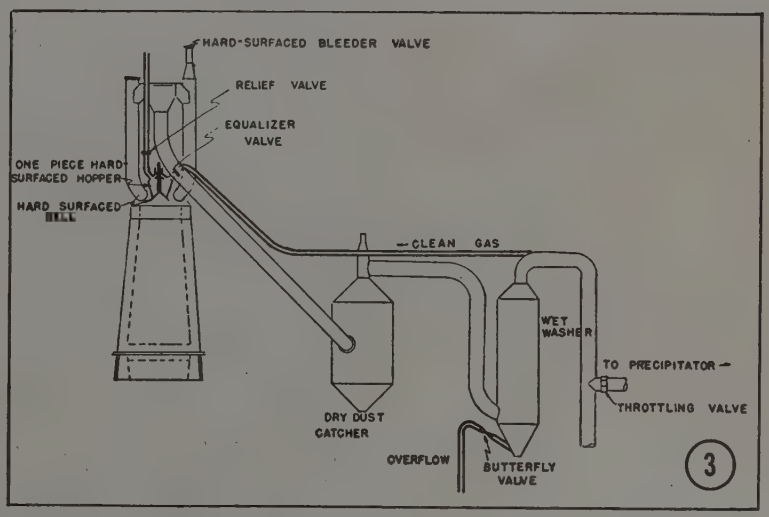
By J. H. SLATER
Assistant General Manager, Cleveland District
Republic Steel Corp.
Cleveland

to 1495 lb per ton iron during the 4-week period in September-October, and to 1635 during the month of January, or a saving of 130 to 255 lb per ton.

Flue dust produced has decreased on both furnaces despite the large increase in wind blown. At Cleveland, where both flue dust and sludge are weighed, the amount of dust (dry) has decreased from 215 to 270 lb per ton of iron (normal operation at 77 to 83,000 cfm planimetered turbo wind) to 145 lb per ton during September-October (85,700 cfm wind and 10 psi top pressure), and to 170 lb per ton during January (98,000 cfm wind and 10 psi top pressure). At Youngstown where the dry dust is estimated by adding 25 per cent to the dust catcher weights to allow for the sludge which is not weighed, the dust has decreased from about 280 lb per ton iron for normal operation (67,500 cfm planimetered turboblower wind) to 240 lb per ton at 80,00 cfm wind and 10 psi top pressure.

Since coke is the largest source of sulphur in the blast furnace it was decided to determine the extent to which this factor controlled the sulphur in the pig iron. Frequency of obtaining high sulphur iron is largely a function of sulphur added in the coke irrespective of variations which have occurred at Cleveland and Youngstown in coke analysis, coke rate, slag volume and slag analysis. Thus decreased coke rate obtained through pressure blowing should result in lower sulphur iron.

At Cleveland the steam rate increased from 14.5 (normal operation, 76,800 cfm at 21.5 psi blast pressure) to 16.1 during the September-October operation when the wind was 85,700 cfm and the blast pressure 28.2 psi. At the same time the steam consumption increased



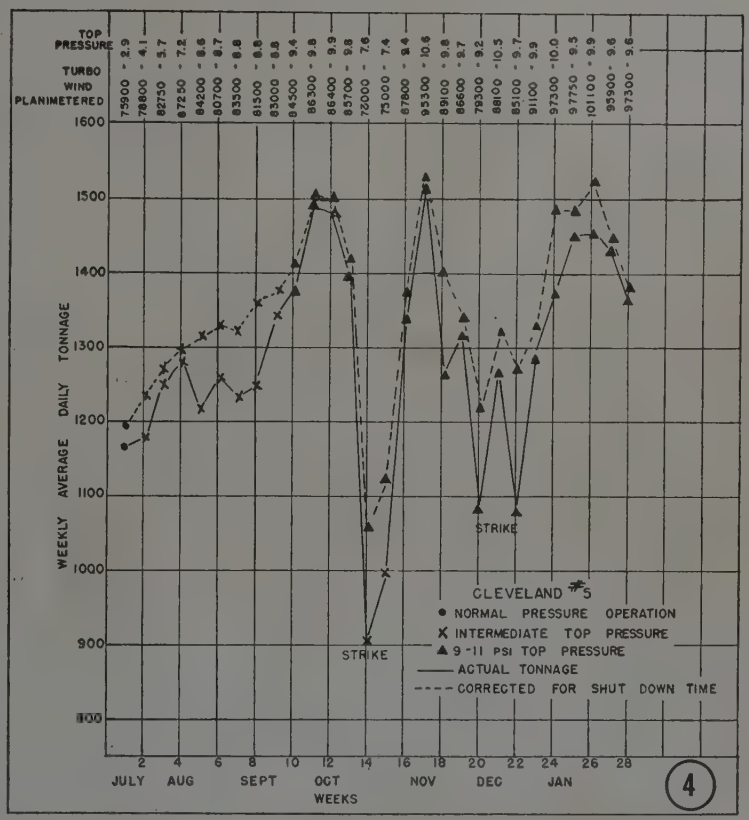


Fig. 3—Blast furnace alteration for pressure operation

Fig. 4—Effect of pressure operation on iron production at Cleveland No. 5 furnace

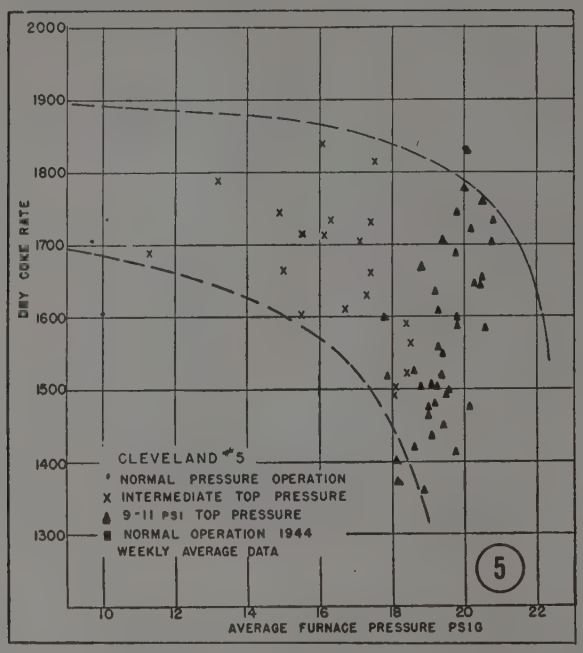


Fig. 5—Effect of average furnace pressure on coke rate

from 1331 to 1374 lb per ton of iron. On December 15, in order to experiment with wind volumes up to 110,000 cfm, the largest volumes so far as we know ever blown, two 90,000 cfm blowers were linked through an intercooler. This is obviously an inefficient method of obtaining high wind volumes, but it is the only method possible at Cleveland since a larger blower is not available. Therefore, the high steam rate and steam consumption obtained in January should not be taken as typical of those possible when proper blower capacity is at hand.

There has been no bell trouble from erosion at either furnace. Both bells have been tested with water and are still tight. It is currently thought that the use of a carefully fitted one-piece hopper at both furnaces has been the main factor in overcoming bell trouble. Hard surfacing the bell and hopper seats is recommended but may not be necessary. The equalizer valve erosion problem with dirty gas has been completely eliminated at Youngstown where clean gas from the wet washer is used. It has not been found necessary to compress this clean gas prior to use as the pressure drop through the wet washer is not large enough to cause trouble when dumping the big bell. Bleeder valves have required replacement after about five months' operation, but it is believed an answer has been found to this difficulty. This will involve: First, hard surfacing the bleeder valve and seat; and second, the construction of a bleeder valve on the wet washer which will be set to operate at lower pressures than those on the furnace and thus take most of the load by bleeding clean gas on small slips. This will also assist in overcoming a dust problem during slipping.

One of the few mechanical diffculties still remaining is the blowing out of the wet washer seal during slips when the furnace is at 10 psi top pressure. A design which will, by means of butterfly valves automatically operated in the outlet main and in the emergency overflow, maintain a nearly constant water level in washer, has just been completed and will be installed in the near future.

Pressure Waves During Slips

The magnitude and type of pressure wave occurring during slips at high top pressure operation is of interest. Indications are that the slip pressure curve is symmetrical about the point of maximum pressure and that the peak pressure at the dust catcher rarely attains a magnitude of more than 16 to 17 psi when the furnace top pressure is 10 psi.

Furnaces cast faster than do the normal furnaces. For this reason there is a small decrease in the amount of first check time (from 36 to 30 min) and a slightly larger increase in the amount of second check time (from 44 to 60 min) for casting per day. However, the total cast time per ton of iron is actually less in the case of pressure operation.

In summary, it appears that the pressure operation is during its early stages of development, causing some increase in delay time, though it is expected this will be curtailed as more knowledge is gained.

Increasing the static pressure in a blast furnace allows the operator a choice in blowing he has not enjoyed previously. Thus, since increasing the pressure lowers the volume and increases the density proportionately at constant temperature, the operator can blow the furnace in any one of the following manners:

1. At a substantially increased wind rate (lb of air per min) and maintain the same gas velocity through the furnace;
2. At the same wind rate and obtain a marked decrease in the gas velocity through the furnace;
3. At an intermediate condition with a moderate increase in wind rate accompanied by a decrease in gas velocity through the furnace.

As the velocity decreases, the efficiency of heat transfer between the rising gases and the burden increases so that the top temperature decreases. It is also evident that, for equal velocities, the top temperature is higher for pressure operation. This is to be expected since the mass flow of gas per unit time at constant velocity is increased as the pressure is increased, resulting in more heat being carried into the top gas. Actually, the pressure furnaces are operated in the velocity region where top temperatures are equal to or less than normal operation temperatures so that it has been possible to decrease the amount of water added to the skips. This increased efficiency of heat transfer assists in decreasing the coke rate.

No relationship between gas velocity and blast temperature could be found. The blast furnace can carry, on the average, about 100 to 150° F higher blast temperature when operated under pressure.

The coke rate increases with the wind blown for any range of burden ratios. Pressure operation permits the advantage of moving to a higher burden ratio curve and thus maintaining a lower coke rate despite higher wind blown.

The fact that iron production in the blast furnace increases as a direct function of the wind blown makes it clear that pressure operation offers the opportunity of greatly increased iron tonnages as blower sizes are enlarged. Thus, the increase of 11 to 20 per cent in iron ouput thus far achieved will be small compared with that possible as new 125,000 cfm blowers now on order are received. As pressure drop decreases, the furnace stock column moves more uniformly and less slipping occurs. Therefore, by operating the furnace at low gas velocities, through increasing the pressure, one obtains a lower pressure drop and less slipping. This, then, is the explanation for smoother operation of the blast furnace under high pressure. Thus it would be impossible to operate a regular low pressure furnace at the burden ratios and wind rates used during pressure operation because the pressure drop resulting would cause excessive hanging and slipping.

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SUMMARY OF OPERATIONS OF NO. 5 FURNACE, CLEVELAND

	Normal Operation 1944	Normal Operation 7/22-31, 1946	Pressure Operation 9/22-10/19 1946	Pressure Operation 1/1-1/31 1947
Iron. Net tons per day, actual tonnage	1,273	1,169	1,435	1,422
Coke, lb (dry) per ton iron	1,673	1,746	1,494	1,635
Stone, lb per ton iron	951	973	824	1,018
Flue dust, lb (dry)/ton iron	270	213	145	170
Slag, lb per ton iron	1,098	1,156	1,143	1,125
Wind, cfm (turbo) planimetered	83,200	76,800	85,700	98,000
Wind, cfm, calculated	78,000	72,200	73,400	83,000
Burden ratio, wet	2.32	2.27	2.52	2.36
dry	2.57	2.40	2.68	2.57
Top press., psi	2.0	3.1	9.7	9.7
Blast press., psi	22.7	21.5	28.2	30.5
Top temp., °F	243	298	306	302
Blast temp., °F	917	936	1,191	1,043
Steam temp., °F	.....	678	684	670
Press. psi	.....	287	286	283
Flow, lb per day (27" vacuum)	.....	1,555,000	1,974,000	2,556,000
Rate, lb per 1000 cfm	.....	14.5	16.1	18.1
Lb steam per ton iron	.....	1,331	1,374	1,790
Wind off time, min per day	21	55	20	38
Checks	.....	5.1	6.9	17.3
Slips	.....	3.5	7.3	16.4
Top gas, CO/CO_2	1.90	....	1.64	1.84
Btu per cu ft	89.3	....	86.5	90.4

crease as rapidly as does the top pressure as the top pressure is raised by means of throttling the top gases. Thus, for constant wind and burden ratio, there is a decrease in pressure drop because of the factor of increased gas density or total pressure. To operate at a top pressure of 10 psi one must increase the blast pressure on the furnace 6 to 9 psi.

Results show that gas velocity, through its effect not only on dust carry-over but also on channeling and slipping, is the controlling factor in dust production. Lower velocities attainable during pressure operation (without the sacrifice in iron production of slack wind operation) thus permit lower dust production. Pressure operation at higher pressures or lower wind rates should permit operation below the critical velocity and in the region of smooth furnace operation where dust production becomes inconsequential.

All blast furnace men should ponder the effect that pressure operation, with its demonstrated control of flue dust production, will have on the utilization of fine ores and ore concentrates in the blast furnace. Pressure operation may well alter many of our ideas with respect to ore beneficiation.

One of the unique features of pressure operation is that it permits a flexibility of control never before available. Heretofore one could not blow a furnace on Lake ore at high wind rates without also having high coke rates and flue dust production. Low coke rates and flue dust could only be obtained by slack wind operation, which has the obvious disadvantage of low iron production. It has now been shown that one can, through manipulation of average static furnace pressure and wind blown, control coke rate, iron production and flue dust production over a wide range.

Thus it is apparent that, for any top pressure, as the wind volume (hence velocity) is increased, the following changes in major manufacturing cost items take place: Iron production increases to the point where a reversal occurs due to decrease in burden ratio with increase in velocity; coke rate increases; flue dust production increases; blowing cost increases; and gas credits increase. This immediately brings to mind the possibility of operation of the furnace at a point of optimum economic balance since some of the cost factors increase while others decrease.

Operation of the iron blast furnace at high pressure results in a significant increase in iron production, a marked decrease in coke rate, a decrease in flue dust produced, and a decrease in heat requirements per ton of pig iron. In other words, the efficiency of the process of reducing iron oxide in the blast furnace has been substantially increased. This is reflected in a manufacturing cost saving of over $1.00 per ton of iron.

Pressure operation permits a new flexibility in blast furnace practice which has not been possible heretofore. By manipulation of the pressure and wind blown, one can alter the velocity of the gases through the furnace over wide ranges. It has been pointed out that this new tool of variable velocity can then be used to control the iron production, coke rate, and flue dust production. Furthermore, this tool allows one to calculate for any given tonnage output possible, for a particular furnace and blower combination, the optimum point of operation for minimum cost per ton of iron, and permits the operator to maintain the furnace at that point.

Operation of the blast furnace at high pressure is still in its infancy. Only the pioneering step has been taken. Operation in the higher pressure ranges, which should effect lower coke rates, is unexplored. Further progress of large order of magnitude is already in sight. The largest blast furnace blowers ever constructed, 125,000 cfm at 40 psi, are now on order for use on pressure furnaces. They will allow operation up to 20 to 25 psi top pressure and should open up a new vista of blast furnace practice.

There is reason to believe that the ability to blow at increased wind rates and control furnace gas velocity will permit the use of pressure operation to be additive to some extent if used in conjunction with other processes for increasing blast furnace production such as the use of beneficiated ore and enriched air blast.

From a paper presented before the general meeting of the American Iron and Steel Institute, New York, May 21-22.

Electronic Equipment Tested in New Laboratory

Geiger-Muller counters and associated electronic measuring equipment may be tested in the new laboratory established in the radioactivity section of the National Bureau of Standards, Washington.

Organized because of the growing demand for reliable, stable instruments, the laboratory will test performance qualities, utility and construction of counters now being manufactured.

The laboratory, in its testing, will attempt to bridge the gap between the manufacturer and the user. Aid will be rendered to purchasers by assistance in the formulation of specifications and, to manufacturers, by the accumulation of test data and by determining the type of counters necessary to various fields of scientific research.

Aluminum Finishes Described in New Data Book

Many surface finishing combinations for enhancing appearance of aluminum are described in the 2-volume edition "Finishes for Aluminum", published by Reynolds Metals Co., Louisville, Ky.

The first section describes eight cleaning treatments, 17 mechanical surface finishes, 15 chemical surface finishes, 11 electrolytic oxide treatments, 12 electroplated coatings, seven paint application methods, seven paint coatings, ceramic coatings, special finishes such as silk screen and sprayed metal finishes and concludes with a discussion of various controls and tests for finishes.

This information is supplemented with 120 pages of shop data on materials, equipment, solution preparation, procedure for finish processes in second section.

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Zinc Alloy Dies

(*Continued from Page* 81)

removed from the mold. That operation consists in cutting the sand away to form a wide shallow, half-round funnel—the flat side being parallel to the pattern and the rounded portion being cut back toward the side of the flask. In open mold casting, the funnel may be from 3 to 6 in. in depth depending on the size of the casting.

Before removal of the pattern, any loose sand is brushed off and the sand around the pattern compressed to a slight bevel with slick. The edge all around the pattern is swabbed with water and slicked, and the pattern rapped lightly to free it from the sand. The pattern then is lifted vertically from the mold either by lifting bars fitted with adjustable hooks or preferably by means of a crane.

After the pattern is removed from the sand, the mold is sprayed with molasses water. All necessary repairs then are made and any loose sand is blown out or removed by a sand suction pump. The mold is skin dried with a blow torch. Last of all, the mold is dusted with talc and is then ready for casting.

Steel inserts often are used to provide greater strength or wear resistance at certain locations. One position where these inserts are used frequently is along the edge of blank holder or binder rings, as these areas are subjected to excessive wear by the metal being drawn across the surface during press operations. No difficulties with this type of insert have been experienced. Such inserts may be located on the original pattern, or, as more frequently happens, the mold may be cut out to allow their proper positioning as shown in Fig. 12.

Projections, undercuts and vertical walls without draft, of course, will not permit the pattern to be withdrawn from the sand without damage to the mold, making the use of cores necessary. Core sand is a blend of bank and sharp sands in a proportion of two of bank to one of sharp. The recommended grain size is 150 to 180 mesh for the bank sand and 150 mesh for the sharp sand. A moisture content of 2 per cent in the blend will be found to give the best results.

A common binder combination in use consists of 2½ per cent cereal binder and 0.5 per cent core oil (all by volume.) Baking temperatures range from 350 to 375° F and under no circumstances should exceed 400° F. The baking time is from 3 to 4 hours, depending on size, and large cores may be allowed to remain in the oven overnight to assure thorough baking.

As the top of the mold is completely open, an auxiliary device is necessary to hold and align cores which are not located by core prints. This consists of a structural iron framework made up of two longitudinal and a number of slotted transverse members, complete with plates for holding the cores in position. These should be sufficient in number to hold the cores securely. The cores are secured to the frame by means of arbor bolts molded directly into the cores. The completed assembly is placed in position over the cavity in the mold and clamped with U-bars and wedges. After carefully checking to insure that the cores are properly aligned, the mold is filled in the usual manner.

Melting and Pouring Kirksite

Too much emphasis cannot be given to the melting and pouring of Kirksite. The alloy is melted in cast iron pots heated by gas or oil with some form of temperature control. While melting pots may be of any size and shape, the alloy can be melted and maintained at a uniform temperature throughout with the least amount of fuel if a shallow, circular, bowl-shaped pot is used. For the most part, local "hot spots" or overheated zones together with localized attacks on the pot walls and resultant contamination, are avoided in kettles of this shape. Temperature changes are slower and heat losses are less if the kettle is of ample capacity, at least sufficient to cast the largest die anticipated without using more than two-thirds of the melt.

Importance of some form of heat control cannot be overemphasized. Temperatures approaching the melting point result in segregation of copper-zinc compounds, while high temperatures cause the alloy to attack the melting pot and become contaminated. In either case, the physical characteristics will be affected adversely and the melt may be ruined. Also, normal pot life will be shortened drastically. Melting units should be of the tilting type from which the alloy may be poured into ladles suspended from an overhead traveling crane.

Cast iron pots are much more resistant to the solvent action of Kirksite than those of fabricated steel, and those made of Meehanite have been found to give good service. Pots of the following analysis, for instance, have proved quite satisfactory in service: Carbon 3.00-3.50 per cent; silicon 1.00-2.00 per cent; manganese 0.60-0.75 per cent; nickel 2.00-2.50 per cent; chromium 1.10-1.20 per cent, and molybdenum 0.40-0.60 per cent.

Cast iron pots of the above composition should be heat treated to produce an oxidized surface which will still further increase the resistance to solvent action. The inside of the pot is first ground smooth and then it is normalized at 1200 to 1400° F for 4 hours. It is cooled to room temperature in a minimum of 12 or, if possible, 40 hours. To increase protection, pots should be stored outdoors until needed and kept filled with a salt water solution to accelerate rusting.

Just prior to the actual melting of the alloy, the pot is cleaned to insure against contamination. The service life can be further increased if a protective coating is applied to the inner surface before beginning melting operations. An iron oxide solution for this purpose is available and can be purchased ready mixed or made up in dry form. Twenty pounds of water is mixed with 16 lb of compound and the resultant solution is

CONTINUOUS CYCLE: Pouring the snap floor is a continuous cycle at the completely mechanized plant of McNally Pittsburg Foundries Inc., Pittsburg, Kans. Molds are placed on skids and rolled to the metal end. After pouring, they are dumped on a scraper conveyor which delivers to a shakeout. Mold boards and skids are returned on a roller-way. Rated at 25-ton melting capacity the foundry turns out a wide variety of gray and alloy castings from snap flask items of 2 oz to sand slinger molded castings weighing 5300 lb

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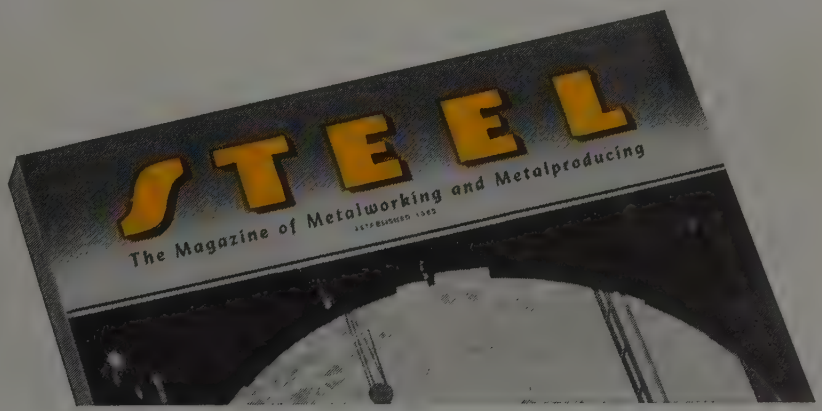

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brushed or sprayed on after the pot has been heated to about 200° F. Two or three thin coats are preferable to one thick one.

After the pot has been warmed up and coated, a dozen or more ingots are loaded into the pot and the furnace is turned on to full temperature. As soon as the melting starts, additional ingots are added a few at a time until the pot is filled to the desired level. Charging may require from 3 to 4 hours, and just before the melting is complete the heat is reduced, either manually or by switching over to the automatic control, so that the temperature of the alloy will not exceed 850° F.

Little scum or dross accumulates on the surface of the melting alloy during this process. No attempt should be made to keep the entire melted alloy surface entirely free, as constant skimming simply exposes new surfaces to oxidation and increases dross losses. Neither should the practice of violently agitating or stirring the metal just before casting be followed for inclusion of dross in casting will result in porosity.

If a thick blanket of dross has been formed, just a part of this is removed before pouring, as the pouring lip skimmer will hold back the balance. When hand ladles are used, the dross is simply pushed aside with the hand ladles or skimmers until the clear alloy is exposed.

Authorities agree that the maximum temperature of the metal should not exceed 900° F. Some advocate transfer from the kettle to the mold at this temperature while others place this point at 850° F. The latter has been productive of the best observable results and is therefore recommended. Holding the melt at temperatures at, or above, 900° F will cause excessive iron pickup from the kettle, rapid oxidation and dross losses, intergranular corrosion and contamination. This will result in excessive shrinkage, increased warpage and brittleness, shorter kettle life and possible spoilage of the melt. On the other hand, holding the alloy between the melting point and 775° F causes segregation of copper-rich compounds which form a heavy sludge at the bottom of the pot and reduce the strength characteristics to the equivalent of pure zinc, again impairing the alloy's usefulness for future operations.

Determining Operating Temperature

Climatic conditions, room temperature and the distance the molten metal has to be carried for pouring, will have their effect in determining the most suitable operating temperature in particular localities. Once these have been established by experience such temperatures should be followed closely, for the fewer the temperature changes the more stable will be the alloy and the dimensional characteristics of the finished product. This means that while a holding temperature of 850° F is recommended, variable conditions may require an adjustment to produce the best results. Extensive experience indicates this can be achieved by pouring the alloy into the mold at 825° F.

Pouring should be done slowly directly from the ladle into the pouring box or sprue. Great care should be exercised, particularly at the commencement of operations, to avoid a gush of metal breaking down the delicate contours of the mold and washing sand into the casting. It is recommended that the stream of metal should not be more than ¾-in. in diameter to begin with, for the slower the metal is poured, the sounder will be the casting and the less the distortion due to inequalities in rates of cooling. After the whole bottom of the mold has been covered, the size of the stream poured through the gate may be increased. When there are two gates used, the procedure is the same except that the metal is poured from two ladles simultaneously and uniformly into the separate gates.

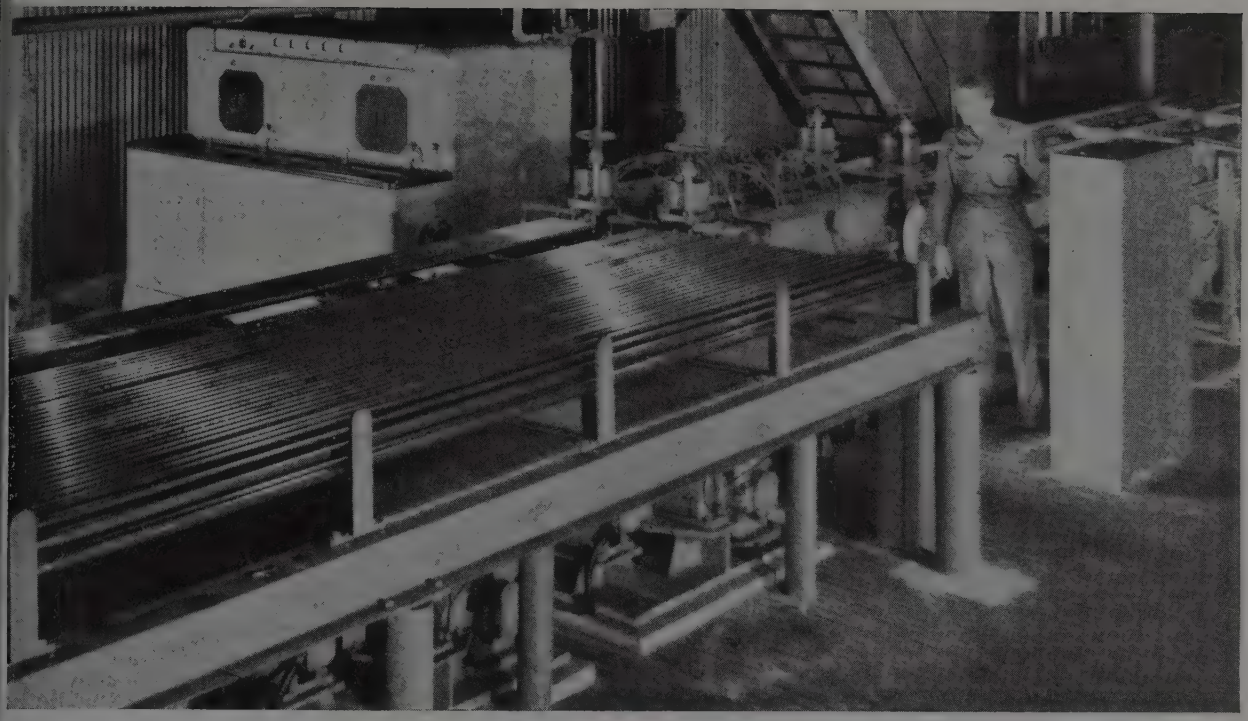
Pouring directly into the die cavity is inadvisable because of the danger of washing some of the sand from the mold face or of splashing the molten alloy, particles of which may adhere to the surfaces of the mold and freeze. If this occurs, the rising level of molten alloy is apt to float these splashes, lifting sand with them and causing bumps in the casting; or to flow around them without remelting, which will cause even more serious surface defects. Only when the metal freezes in the gate during a changeover or ladle refill, should the alloy be poured directly into the mold.

As the metal rises in the mold, any scum or dross which forms, or which may have passed by the pouring lip skimmer, should be guided away from the side walls of the mold and removed, as adherence to the walls will cause a rough surface. If the ladle holds insufficient metal to fill the entire form, hand ladles should be used to keep the sprue filled while the crane ladle is being reloaded, or another ladle is being moved into position. Otherwise, the metal in the pouring box and riser may freeze or partially solidify, interfering with the rest of the operation.

Unless there is an ample supply of molten metal to feed the casting, the forces set up during solidification are sufficient to pull portions of the surface inward, causing draws, or to suck molten metal from a partly solidified heavy section to a liquid lighter one, causing porosity. Several expedients have been developed to overcome or compensate these tendencies.

Draw marks are a serious factor principally in deep drawing dies, and make their appearance generally toward the center of the deepest portion of the dies. This tendency is overcome to a degree by making bottom sections a little thicker than would be necessary from the point of view of strength alone. In addition, the metal above the shallow point is kept in a molten state with a gas torch, until the heavier adjacent section has completely solidified. Then, as the lighter section is allowed to solidify, additional molten alloy is added with a hand ladle and fused into the parent metal as

HEATS AND FREEZES: Combination oven-refrigerator in the accompanying view varies temperatures from 50° below zero to 200° above. It was constructed at the Westinghouse research lab, Pittsburgh, to test the strength of Micarta plastic used in making engine gears and aircraft parts. Here, Frank Cassel, research engineer, is measuring dimensions of a test piece in the heater-cooler before beginning a fatigue test. The stick, along with a similar one to its left, is vibrated up and down 15 times every second day and night for as long as 3 months. While one end of the plastic stick is held stationary, the other end is fluttered rapidly by the rotating arm and wheel. Amount of load applied, and changes in plastic flexibility are measured by the wire resistance strain gage at the stationary end of the vibrator. Unit is heated by electric coils and cooled by dry ice



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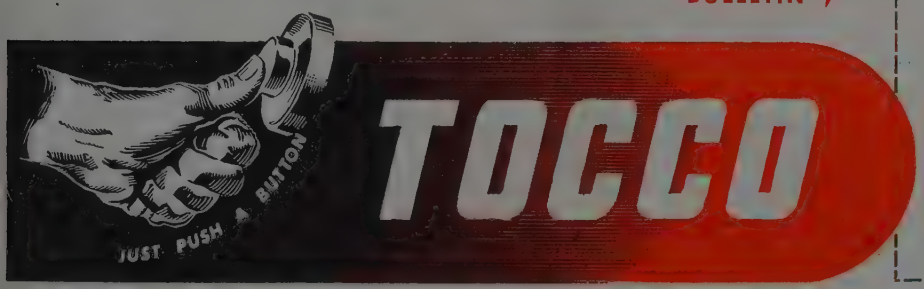

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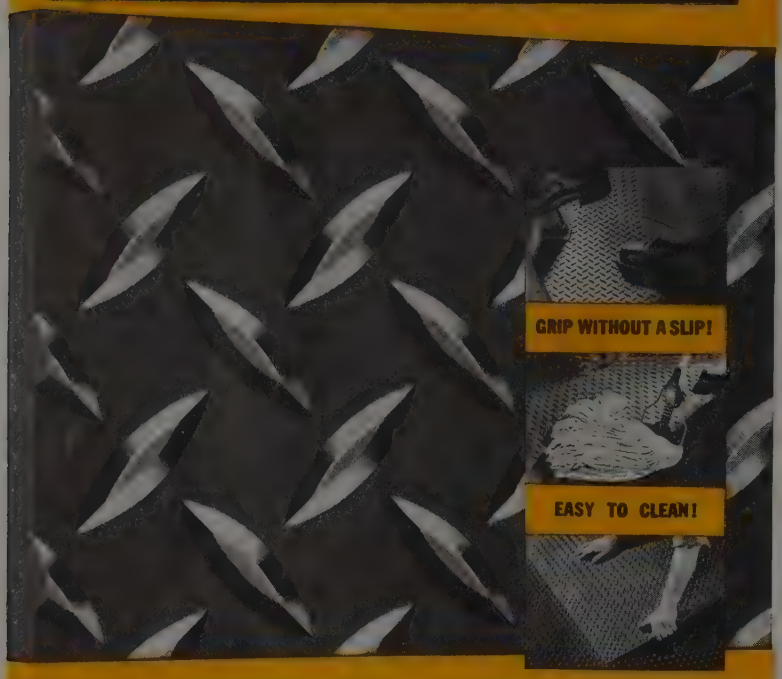

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contraction takes place. When an oxy acetylene torch is used, a large tip fitted and the supply of oxygen reduce to produce a reducing or soft flame.

While the above operations have bee described separately, in casting a larg die they all may be carried on simul taneously. That is, while the alloy i still being poured from the crane ladle another operator may be retarding solidi fication with a torch, and still anothe may be filling shrinkage depressions fro a hand ladle. With experience, thi combination of methods will produce casting with the most uniform interna structure, least porosity and flattest bot tom without distortion, warpage, or in ternal stresses.

Reducing Pouring Time

Various other methods have been trie in an attempt to reduce pouring an solidification time. One way is by pour ing the die in two or three layers, tha is, one-half of the die cavity is filled with the alloy and allowed to solidify; a sec ond layer is poured to within about an inch of the top and allowed to solidify; and, finally, a third layer or "cap" is added to fill any depressions and pro vide a smooth base. A still shorter and less accurate method is to fill the die cavity up to within an inch of the top, allow it to solidify and then "cap" it for the purpose of obtaining a smooth base. This method, of course, does not elim inate "draws" and internal stresses, or porosity; it simply covers them up. How ever, none of the shortcut methods is as satisfactory in end results as the con ventional procedure given previously.

During the off-periods between heats, the temperature control should be set, and remain at 800° F until resuming op erations, and the molten alloy should not be stirred or agitated in any way for the reasons previously given. It is es sential that an even temperature is main tained by automatic control as with manual operation the temperature of the melt is apt to fluctuate with undesirable results. When no casting is to be per formed over a long period, the Kirksite in the pot should be poured off into pigs formed of molding sand, in one or more flasks, and the furnace should be shut down entirely.

Length of time a pot should remain in operation before cleaning depends on the frequency of casting. The more often pouring is done, the more likeli hood that coatings of the alloy will ad here to the exposed portion of the pot walls. If necessary, pots can be operat ed continuously for 2 weeks without in jury if proper temperature control is exercised. It will be found more prac ticable, however, to shut down at the end of each weekly period as the time

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required for cleaning is negligible. Most of the alloy can be peeled off by hand or chipped off with a hammer and chisel. Only in unusual instances will it be found necessary to employ a welding torch to melt down adhering particles or foreign matter.

Obsolete, worn, or broken dies can be used to charge the furnace but should be added to a heel of molten alloy representing between 5 and 10 per cent of the pot capacity. When such dies are melted, care should be taken that all ferrous inserts are removed. Should they accidentally be left on the die and fall to the bottom of the pot, they should be immediately removed. No additional fluxing is required.

Dies which have been metallized with steel cannot be handled in this way, as the steel particles cannot be removed from the melt. In such cases, the metallized portion of the die should be cut away and scrapped.

Clean borings, turnings, and other scrap likewise may be added to the melt without fluxing, but should be submerged in the melt with a skimmer to avoid oxidation. Care should be taken that no ferrous particles are included in the scrap. After skimmings, or dross, have been accumulated to the point where there is a sufficient quantity to fill the pot, it is possible to reclaim a fair portion of the alloy by treatment with a flux. A 50-50 mixture of sal ammoniac and zinc chloride (anhydrous) makes a fairly satisfactory flux for the purpose, and will be found most effective in segregating dirt, oxides, and other impurities so that they will float to the top of the melt where they can be skimmed off with the dross.

After the casting has solidified it is ready to be removed from the mold. The casting is lifted by the crane and conveyed a short distance, where it is sprayed with water to increase its hardness. It is desirable that the spraying be done while the casting is still at a temperature of 400 to 450° F. Accordingly, only a short time should elapse between solidification and this treatment to raise the hardness of the casting 25 to 30 points on the brinell scale. After the casting has cooled, the gate and other projections are removed. Finally, sand adhering to the surface and in the cored cavities of the castings or dies are removed.

Magnesium Alloys

(*Continued from Page* 86)

nesium surface. Details are given for those chemical treatments most commonly used.[19]

The chrome-pickle treatment is primarily a producer's treatment which is applied to protect magnesium parts during storage and shipment. It is, however, often used by the metal finisher when a paint base coating with low electrical resistance is required for bonding purposes. It is also used to remove flux after gas welding. When conditions permit, the chrome-pickle can be used for touch-up on areas from which the chemical treatment has been removed, as well as for brush applications on parts too large to be immersed.

The etching action of the chrome-pickle treatment removes about 0.0006-in. of metal per surface (0.0012-in. per dia) and hence cannot be used on machined surfaces unless tolerances will permit or proper allowances have been made. Magnesium parts containing steel or brass inserts can be given the chrome-pickle treatment. Polished steel surfaces, however, should be protected with a thin film of lacquer which may be removed later with a solvent.

The chrome-pickle treatment consists, in general, of a dip requiring one-half to 2 min, depending on the freshness of the solution, in the following bath maintained at room temperature (70-90° F):

Sodium Dichromate ($Na_2Cr_2O_7 \cdot 2H_2O$) ..... 1.5 lb
Conc. Nitric Acid (SP.Gr.1.42) ..... 1.5 pt
Water ..... to make 1.0 gal

Technical grades of these chemicals may be used. Pure aluminum, glass, or ceramic tanks may be used for holding the solution. Welded pure aluminum tanks are most practical for large installations.

After the dip it is advisable that the parts be held above the tank for approximately 5 sec. In addition to allowing the adhering solution to drain off, a better colored coating is produced. The parts are then washed in cold running water followed by a dip in hot water to facilitate drying.

Magnesium die casting should preferably be given a 10 sec dip in the chrome-pickle solution heated to 120° F. Longer time of treatment results in an excess of powdery deposit. Articles that are too large to be immersed in the chrome-pickle solution should be well brushed with a generous amount of fresh solution; this is allowed to remain on the surface for about ½-min and then is washed off. The coating thus formed is less uniform in color than that produced by the dip process, but it is as good as a paint base. In treating riveted assemblies care must be taken to avoid entrapping solution in the joints.

The color, luster and etch produced by the chrome-nickle will vary with the age of the solution and with composition and heat treatment of the alloy. Certain colors and etches are superior to others as paint bases. The most desirable is a matte, gray to yellow-red iridescent coating which exhibits a network or pebbled etch under the microscope. This type of coating is readily obtained in fresh solutions. Coatings to be avoided are those which are bright and brassy in color and which show a relatively smooth surface with only occasional rounded pits when examined under the microscope.

Depletion of the chrome-pickle solution is indicated by the paleness of the color, shallowness of etch and slowness of action on the metal. The paleness of color should not be confused with that obtained by insufficient exposure to air between removal from the bath and wash in water. Control of the bath is best accomplished by analysis. Details of rapid analytical procedures are given below.[20]

Chromate Determination: Pipette 5 ml of the chromate pickle solution into a 400 ml beaker containing 300 ml of water. Titrate with constant stirring with a $Pb(NO_3)_2$ (lead nitrate) solution (containing 0.1332 g $Pb(NO_3)_2$ per milliliter) until the yellow precipitate of $PbCrO_4$ (lead chromate) ceases to form. Toward the end of the titration the precipitate should be allowed to settle and a drop or two of the $Pb(NO_3)_2$ solution added to the clear supernatant liquid where the precipitation of the $PbCrO_4$ may readily be observed.

Should a precipitate form, stir the solution and repeat the settling operation and addition of $Pb(NO_3)_2$ until the precipitate ceases to form. Note the number of milliliters of $Pb(NO_3)_2$ solution. Each milliliter is equivalent to 0.1 lb $Na_2Cr_2O_7 \cdot 2H_2O$ per gal. The equation involved in the above titration is as follows:

$$Na_2Cr_2O_7 + 2Pb(NO_3)_2 = 2\ PbCrO_4 + 2HNO_3 + 2NaNO_3 + H_2O$$

Knowing the volume of the treating bath, the amount of dichromate to be added may be readily calculated.

Nitric Acid Determination: After completion of the chromate titration with $Pb(NO_3)_2$, add an excess of 0.5 ml of the $Pb(NO_3)_2$ solution. Filter off the $PbCrO_4$ precipitate through a plug of absorbent cotton or filter paper. Wash the precipitate with distilled water a few times, collecting the washings in the filtrate. Reject the precipitate. Add 2 or 3 drops of methyl orange indicator to the filtrate and titrate with 1 N sodium

NO SCRATCHED SURFACES: Designed to handle metal tubing, bars and shapes without scratching fine finished surfaces, the sling shown here handling stainless steel tubing through a pickle bath is made of patented flexible metal mesh. Manufactured by Cambridge Wire Cloth Co., Cambridge, Md., the 6-in. wide sling is furnished in any metal that can be drawn to wire to meet conditions encountered in various operations such as pickling, annealing and cleaning

hydroxide solution (NaOH) until the solution turns yellow.

The addition of too much methyl orange renders the end point less distinct, particularly with solutions which have been used and revivified several times. Note the number of milliliters of 1 N NaOH required for the titration. The equation involved in this reaction is as follows:

$$HNO_3 + NaOH = NaNO_3 + H_2O$$

It should be noted that in the first equation nitric acid is liberated. This must be corrected for in the calculation for nitric acid as follows:

$$A - (B \times 0.403) \times 0.101 = C$$

where A = total 1 N NaOH used, in milliliters.

B = total $Pb(NO_3)_2$ solution used, in milliliters, and

C pints of nitric acid (sp gr 1.42) per gal of chrome-pickle solution.

Knowing the volume of the treating bath, the amount of nitric acid to be added can readily be calculated.

Dichromate Treatment: The dichromate treatment provides good salt water resistance and maximum paint adhesion with practically no effect on dimensions of parts. The treatment is normally applied after machining and before painting. Brass, bronze, cadmium plate and steel are unaffected by the treatment; thus castings and other parts containing bearings, studs, and inserts of these metals may be treated. Aluminum, however, is rapidly attacked.

The dichromate treatment consists essentially of two steps, usually applied immediately after alkaline cleaning: Step 1—Magnesium parts are immersed for 5 min in an aqueous solution containing 15 to 20 per cent by weight of hydrofluoric acid (HF) at room temperature (70-90°F). A satisfactory bath can be prepared by diluting one volume of technical grade 48-52 per cent HF with two volumes of water. An alternative procedure suitable for wrought products only, consists of an immersion for 15 min in an aqueous solution containing 5 per cent sodium, potassium or ammonium acid fluoride at room temperature (70-90°F).

The acid fluoride alternative treatment will not attack aluminum inserts, rivets, etc. and is more economical to use than hydrofluoric acid; however, it should not be used on castings of any type because inferior protective results will occur. Both treatments are followed by cold water rinse.

Step 2—Magnesium parts from Step 1 treatment are boiled for at least 45 min in a water solution containing 10 to 15 per cent by weight of sodium dichromate ($Na_2Cr_2O_7.2H_2O$). This solution is prepared by dissolving technical grade sodium dichromate in water in the ratio of 1.0 lb per gal. The original solution level is maintained during operation by addition of water to replace that lost by evaporation.

Following treatment, parts are rinsed thoroughly in cold running water followed by a dip in hot water to facilitate drying. The presence of fluoride (provided by film produced in Step 1) in the dichromate bath is essential for proper operation. In some cases it may be advantageous to add from time to time 3/4 oz per gal of calcium or magnesium fluoride to the bath, or to suspend a bag of calcium or magnesium fluoride in the bath. If this is done the treatment time usually can be reduced from 45 to 30 min.

Properly applied coatings from the dichromate treatment will vary from dark black to black. Time of treatment, condition of bath and alloy composition will influence color of coating. Lead tanks may be used for the hydrofluoric acid bath. The dichromate solution can be used in iron, aluminum or almost any of the commonly used tank materials. The dichromate treatment process is best controlled by frequent chemical analysis.[19]

Hydrofluoric Acid Determination: The hydrofluoric acid bath is depleted very slowly in use. It should not be allowed to go below 10 per cent HF as determined by a titration for free acid with normal NaOH and phenolphthalein indicator. Hydrofluoric acid should be added to the bath as needed to maintain the titration between 10 and 20 ml of 1 N NaOH per 2 ml of sample. This corresponds approximately to 10 and 20 per cent HF by weight. A pipette for obtaining a bath sample may be made by lining a small (3 or 4 ml) glass pipette with paraffin wax and calibrating to a 2 ml volume. To avoid error by reaction of the HF with glass, the sample should be discharged into at least 100 ml of distilled water in the vessel used for titration and titration should be done immediately.

If bifluoride is used instead of the hydrofluoric acid, it also can be controlled by titration with caustic. The bifluoride content should be maintained so that a 100 ml sample requires 45 to 55 ml of 1 N NaOH to produce a permanent pink color with phenolphthalein indicator.

Control of the sodium dichromate solution is accomplished by maintaining the pH between 4.2 and 5.5 with chromic acid, conveniently added as a 10 per cent solution. Although pH is the governing factor in control of the dichromate bath, occasional analysis for $Na_2Cr_2O_7.2H_2O$ content should be made by titration with Pb $(NO_3)_2$ solution. The $Na_2Cr_2O_7.2H_2O$ content should be maintained at 8 to 15 per cent.

Sealed Chrome-Pickle Treatment: This treatment is a modification of the regu-

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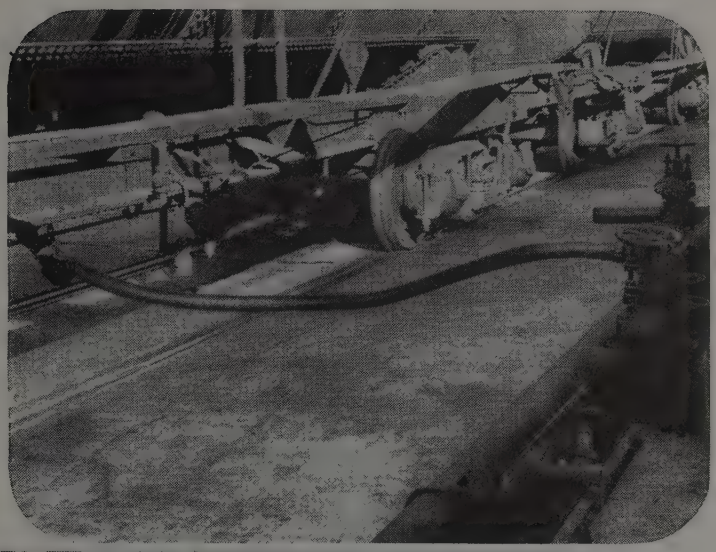

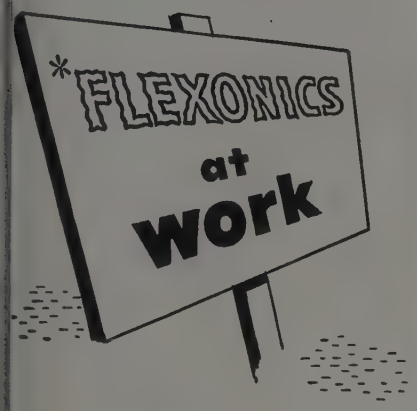

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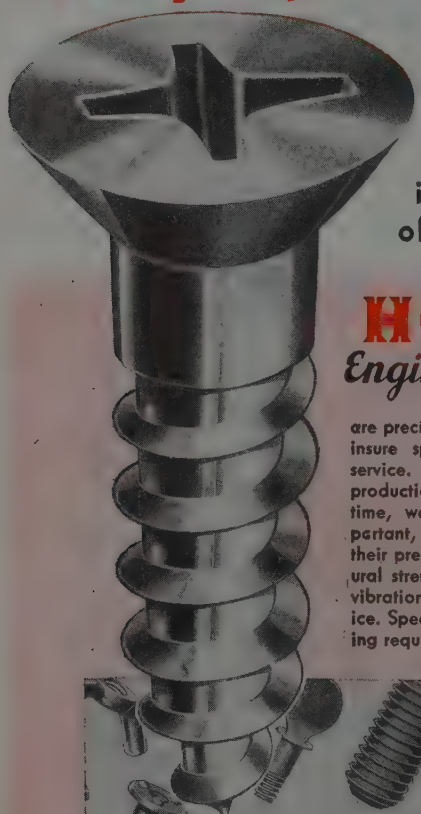

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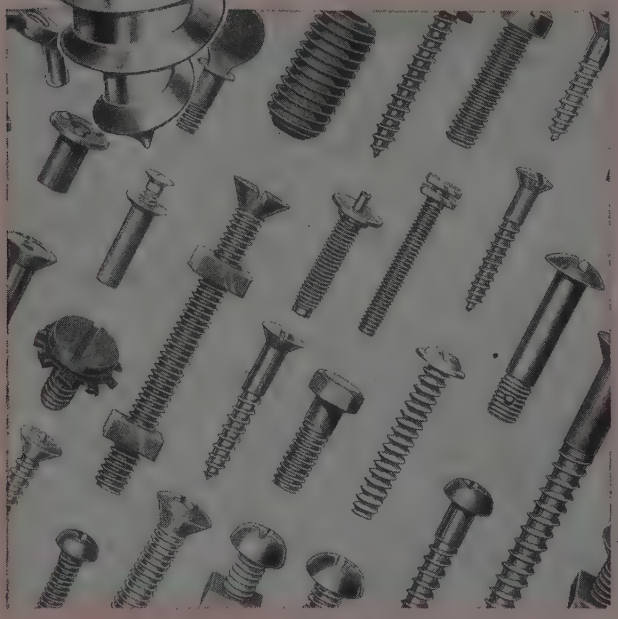

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lar chrome-pickle treatment previously described. The treatment will provide protection equivalent to that of the dichromate process on wrought magnesium alloys. On sand castings, however the protective value is somewhat less if they are to be used at all in this process they should be given a preliminary dip in the hydrofluoric acid bath previously described under step 1 of the dichromate process, or alternately they may be acid pickled in the nitro-sulphuric bath described in that section.

The treatment is a two-step process the first of which is the regular chrome-pickle procedure. The second step consists in boiling the work for 30 min in a bath containing 1 lb of sodium dichromate per gallon. This is identical with the second step of the dichromate process. The boil in dichromate does not change the appearance of the original chrome-pickle coating.

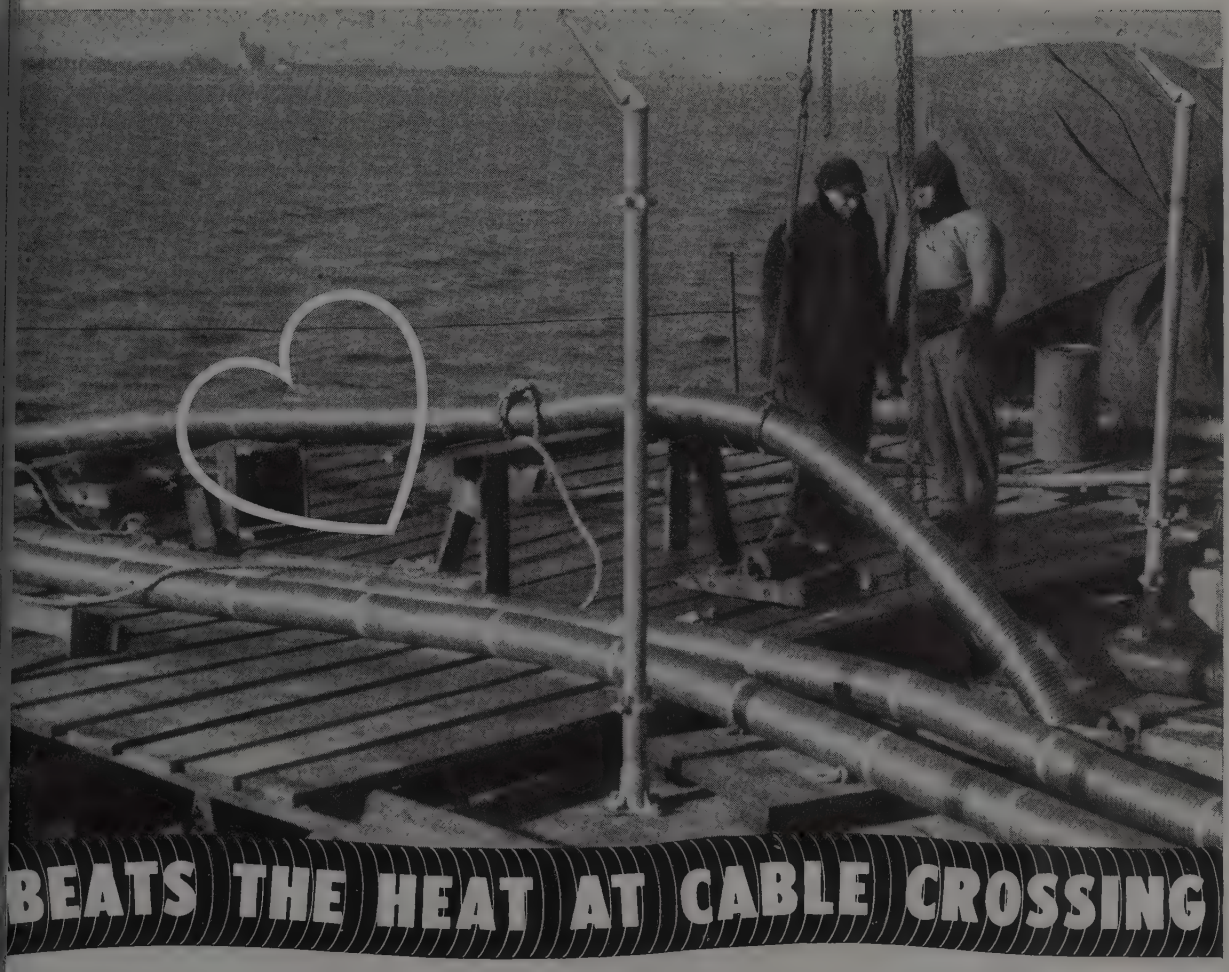
CORRECTION

In the illustration accompanying the article "Application of Oxygen for Refining Low Carbon Heats", May 5 issue, page 107, the burner at plant C should have been designated "low velocity burner."

The sealed chrome-pickle is particularly suited for use on assemblies in which aluminum rivets have been used, since the hydrofluoric acid dip of the regular Dichromate treatment reacts quite vigorously with aluminum. The treatment is not suitable for use on small parts machined to close tolerances because of the amount of metal removed by the chrome-pickle. Appropriate methods of analysis have already been described.

Anodized Magnesium: A method is available for producing relatively heavy protective coatings on magnesium alloys by electrochemical treatment.[20] The treatment, designated AMC treatment R, was developed for the American Magnesium Corp., and is reported to have been used in the aluminum research laboratory for a number of years for the protection of magnesium alloys and as a base for paint coatings. This finish is produced by anodic oxidation of the magnesium in a sodium hydroxide electrolyte followed by sealing in a chromate solution.

Coatings which are formed on magnesium alloys by certain electrolytic treatments are thicker and considerably more resistant to abrasion than coatings that are formed by simple chemical treatment. Resistance of these oxide coatings to corrosion can be improved appre-



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Penflex "Flexineering" helps solve problem of cooling power cables at river crossing

Cooling and protecting eight under-water power cables as they emerge from the water's edge into the shore terminals was a man-sized problem—until Penflex Engineers, teamed with the construction company, furnished the right answer—flexible cooling jackets.

Long sections of 3½" dia. bronze Penflex hose encase each cable from river's edge to the terminal. These were permanently centered in 6" dia. sections of the same length. After sealing both ends of the units, water was circulated through the 6" sections, forming tight, flexible jackets that keep cables cool and protected. Tailor-made by Penflex, these units were easily installed, saving man-hours, cutting costs.

Streamlined for quick service, Penflex "Flexineering" can help solve numerous flexible tubing problems for machine tool manufacturers . . . construction and road building firms . . . oil refineries . . . shipbuilders . . . power plants . . . and other industries.

Backed by 45 years of engineering know-how, Penflex offers complete service on flexible tubing layout design for your specific needs. Call on Penflex for a full line of flexible metallic hose, tubing, and couplings, from ⅛" dia to 30" dia., in all types, for all uses. Also time-saving automatic barrel fillers, rivet passers. For handy bulletins containing complete information, write today to . . .

PENFLEX SALES COMPANY

Division of

PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY

7219 Powers Lane — Philadelphia 42, Pa.

BRANCH SALES OFFICES—Boston • New York • Syracuse • Cleveland • Chicago • Houston • Los Angeles • Washington, D. C.

Penflex... HEART OF INDUSTRY'S LIFE LINES

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ciably by using a final sealing treatment. For magnesium, therefore, coatings of this character are of considerable advantage where resistance to both abrasion and corrosion is essential.

In the anodic treatment of magnesium alloys, the condition of the surface of the article being treated is of much importance and has considerable influence on the voltage requirements and the resulting coating. The throwing power of the sodium hydroxide electrolyte is much less than that of the sulphuric acid electrolyte used for the Alumilite treatment of aluminum alloys. Consequently it is essential to have the surface of the magnesium alloy as clean as possible. Special cleaning procedures are necessary to accomplish this.

Ordinarily, most of the grease can be removed by treatment in a nearly boiling 5 to 10 per cent sodium hydroxide solution, or in a solution containing sodium carbonate and tri-sodium phosphate. Following degreasing, an additional treatment of some type should be used to remove heavy oxide films. This usually is accomplished by immersion in a chromic acid solution. If the oxide coating is to be subsequently dyed, however, a 2-min etching treatment in a 20 per cent ammonium chloride solution at room temperature may be used instead of the chromic acid solution. For magnesium castings that have not been machined, it may be neccessary to use a nitric acid-sulphuric acid solution to remove some of the surface skin rapidly before using either the chromic acid solution or the ammonium chloride etch.

After being thoroughly cleaned, article is connected as an anode in an electrolyte containing 5 per cent sodium hydroxide and treated for a period of 30 min with a current density of 12 to 18 per sq ft. Ordinarily a potential of 4 to 5 v will be satisfactory when the temperature of the electrolyte is between 140 and 160° F.

Good electrical contact is essential for consistent results. The use of high current densities will give rise to difficulties from poor contact. After the electrolytic treatment, the coated article should be washed thoroughly in water and then sealed for 30 min in a sodium chromate solution which is maintained at a temperature of 170 to 180°F. Following the sealing treatment, the oxi coatings have a slightly yellowish co and are relatively smooth and har These coatings provide good protecti against abrasive and corrosive acti and serve very satisfactorily as a ba for painting.

The anodic oxide coatings produc on magnesium differ from those aluminum in that boiling in water do not seal the coating or prevent the a sorption of organic dyes. The anod coating produced on magnesium can colored with many of the organic dy that are used for coloring oxide coatin on aluminum. These colored coatin can be employed to advantage on ar article of magnesium which is not su jected to corrosive conditions. The dye magnesium oxide coatings, however, a not very resistant to fading under ou door exposure.

(*Concluded in later issue*)

REFERENCES

17. Proc. Am. Electroplaters' Soc. (1942)
18. Society Chem. Ind., 50, 83 (1931)
19. "Finishing Magnesium", publication of Ma nesium Division, Dow Chemical Co., M land, Mich.
20. The Iron Age, 157, Nov. 12, 48 (1946)

Turning

(*Concluded from Page* 75)

those for jobbing and ordinary production operations, and those for tool room use. The distinction was in terms of accuracy as well as in terms of special functions and attachments. Today the distinction largely has disappeared as far as accuracy is concerned, between the best of the "shop" lathes and those for tool room use.

That doesn't mean that the tool room lathe is not a definite entity. What it does mean is that demands of production men for accuracy now approach those of the tool makers. That is one reason why machine tools now cost more than they used to. There is no room now for mediocrity and quality is an expensive ingredient—more so in machine tool building than in mass production.

Another trend in the engine lathe business is toward systems of automaticity which can be "turned on or off" as required. Among these are shape-cutting systems by means of which shapes other than circular can be "turned"—molds for example. Others permit contour machining under control of templates. Still others permit multi-diameter turning of repetitive work through program control of multiple tools by means of electrical or electronic systems. Some of the latter are capable of giving conventional automatics quite a run for the money.

Program control also is evident in turret lathe practice, through use of preselected speeds and feeds and also through methods of self-actuation of slides, through the medium of programming drums and similar devices. Simplification and standardization of turret lathe tooling and setting of the machines themselves have been carried to the point where these machines often can profitably be set up for production of as few as six pieces of work. Many are being used in tools rooms for that reason.

The effect of carbide tooling on design of all kinds of machines for turning has been equivalent to a gale of wind which has blown away old ideas as to speeds, feeds and power, strength and rigidity, methods of holding work, methods of mounting tools, disposal of chips, and so on for practically all design features. High speed steel began to exert similar pressure on machine tool design nearly 50 years ago, but that pressure was nowhere near as heavy—nor were its effects anywhere near as swift or as sweeping as those of the carbides.

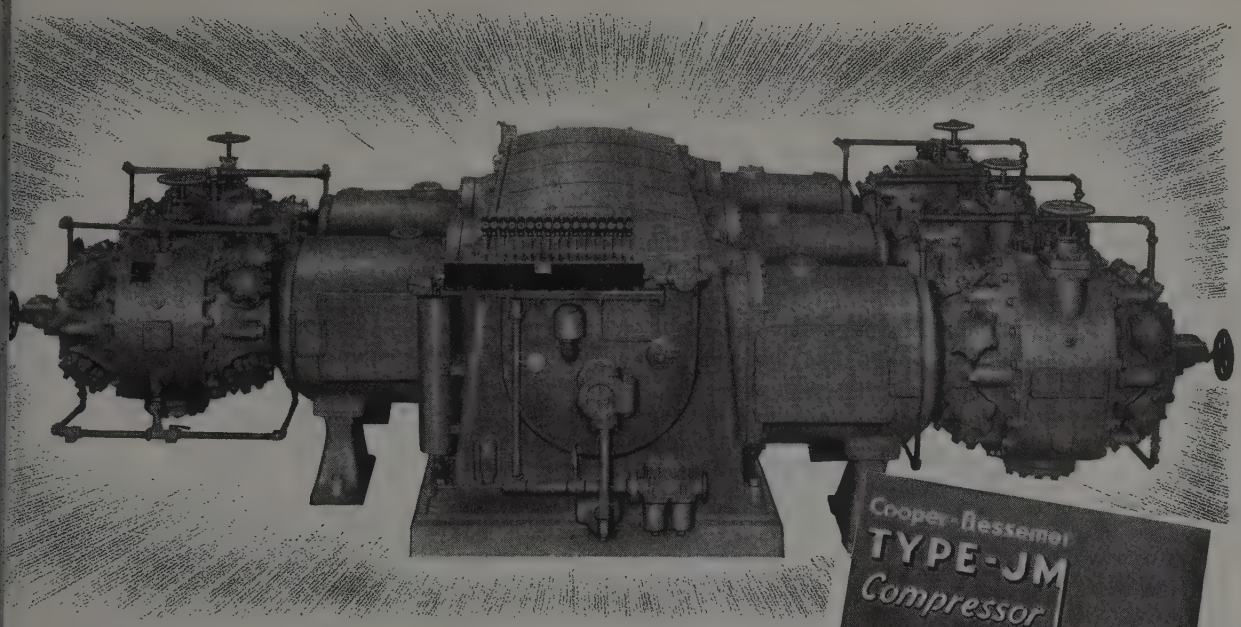
Today we are in this carbide era so deep that every production turning machine is affected. Not only that, but a new family of machines has been brought into the turning field—these being the ones once called "diamond boring machines", but now adapted to high speed precision turning with carbide tools. These often handle work once considered unmachineable by single-point tools.

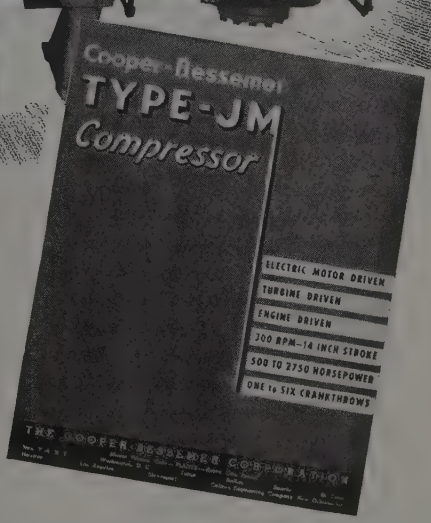
At the other end of the scale, carbide tooling has changed the technique roughing and finishing big work. Heav duty tools—in some cases negative rak tools—get the metal off in a hurry, whil carbide finishing cuts at high speed an fine feed give surface finish of unusu quality from the surface analyser poin of view. These things cannot be accom plished, however, on lathes of Williar McKinley vintage, or even of Calvi Coolidge vintage, and there may b much question about many of those o 1935 vintage.

Important as it is in this era of car bide tooling, cutting speed by no mean is the only factor to consider when eval uating machines for turning. Fully a important from the standpoint of pro duction costs, is rapid loading and un loading of work and minimum of "idle or nonproductive time during cycles and between cycles. Last and by no mean least, consider ease, convenience and safety of operation. These things have direct bearing not only on production costs, but also on labor relations. No workman today wants to run incon venient, hard-to-operate, or dangerou machine tools. No employer today can afford to pay any workman to struggle with such a machine.

—o—

Completely automatic in operation, an electric insecticide sprayer made by West Disinfecting Co., 42-16 West street, Long Island City 1, N. Y. is housed in a hammered aluminum case, reducing weight to approximately 8 lb.





Introducing A GREAT NEW COMPRESSOR...

This descriptive bulletin gives the facts about the new Type JM Compressor. ASK FOR IT.

THIS new *motor-driven* compressor, latest achievement of Cooper-Bessemer engineering offers remarkable advantages in the 500 to 2750 hp range. For example: tremendous savings in space . . . the flexibility of one to six crank-throws . . . a new conception of maintenance accessibility . . . the extreme durability in which Cooper-Bessemer units have long excelled . . . and a complete range of compressor cylinders, for air or any gas, from low vacuums to highest pressures, all fully proved by years of unsurpassed performance with the popular Cooper-Bessemer Type GMV engine-driven compressors.

Yes, the JM compressor, especially designed for heavy duty motor-driven service, is ready now to give you exceptional efficiency *plus* sensationally low cost in housing, installation, operation and maintenance.

Send for the descriptive bulletin. Get acquainted with the JM compressor and see what these savings can mean to you.

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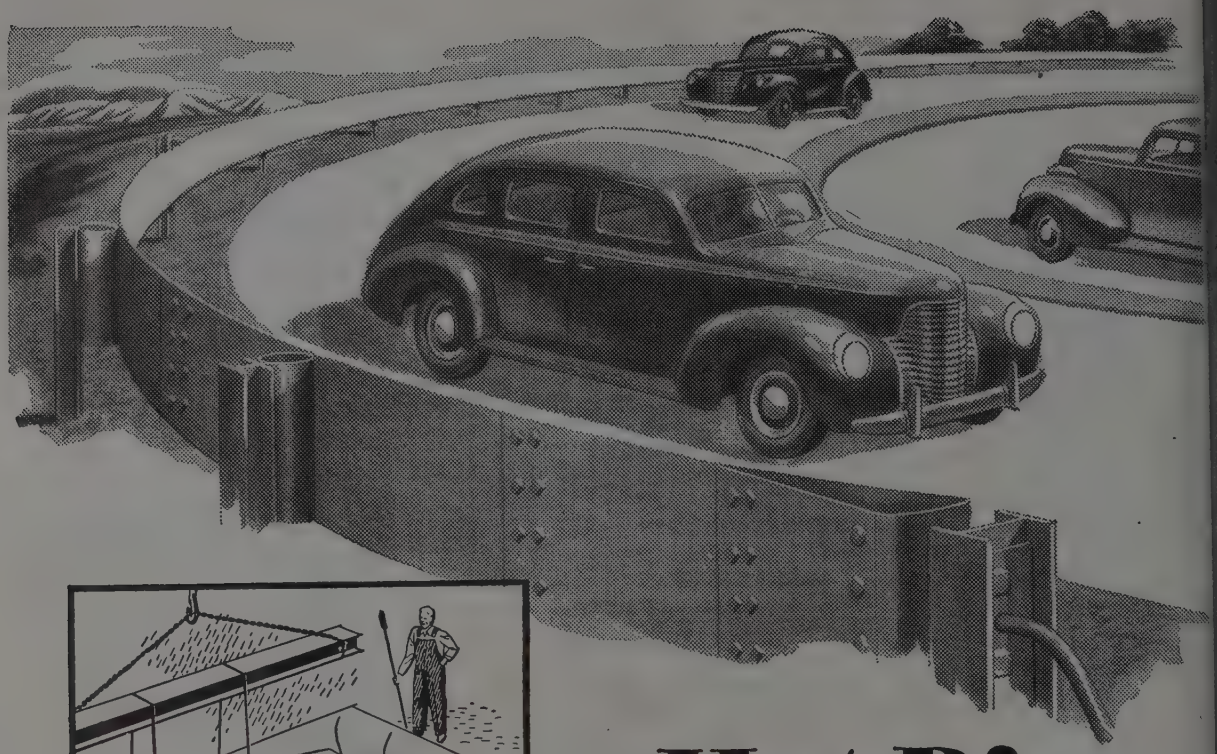


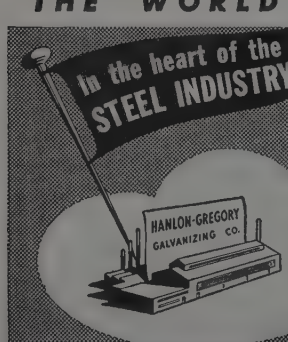
Hot-Dip Galvanized Guard Rail *Lasts Longest*

Hot-Dip Galvanizing by the Hanlon-Gregory method provides the utmost in rust prevention for any exposed iron or steel installations.

Hot-Dip Galvanizing will give *your* product or installations greater uninterrupted service. The Hanlon-Gregory method will save you expensive replacement and maintenance costs.

The World's Largest Job Galvanizing Plant—located in the very heart of the steel industry—is prepared to provide the best *proved* protection against rust for your products in any quantity.

THE WORLD'S LARGEST JOB GALVANIZING PLANT



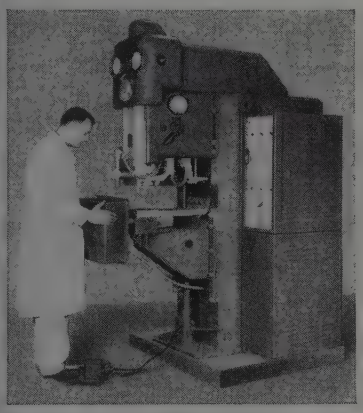
HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 128

1. Welding Control

Synchronous-precision alternating current resistance welding controls in a complete, unified, factory assembled package are being produced by Westinghouse Electric Corp., Buffalo. The Synchro-Trol controls have eight basic factory as-



sembled subunits and five basic supplementary subunits from which hundreds of combinations for timing and sequencing may be made.

Units may be either floor or side-of-welder mounted, the latter shown in the photograph. Finger tip control speeds production as each job may be quickly set. Inspection is simplified through a front access door. A swing-out feature provides access to the rear. Subunits are of the pull-out type and may be removed quickly for changes in control requirements.

2. Ratchet Wrench

A ratchet wrench, for handling hard-to-remove nuts, fits on quickly, grips securely and ratches automatically, according to its manufacturer, Logan Tools Inc., Lambertville, N. J. It slips on nut from side or top, engaging it with an encircling grip. Double broaching permits its use within a 30-degree arc. Ratchet construction makes it unnecessary to remove wrench until tightening or loosening is done.

3. Paint Base

Reacting chemically and bonding with aluminum surfaces in 15 to 60 sec, Prepaint, a material for applying to aluminum and its alloys which are to be painted or lacquered, is announced by Colonial Alloys Co., Ridge avenue and Crawford street, Philadelphia 29. It may be applied at room temperature by dip, spray or brush, and is nontoxic. Wrought, cast, die cast, machined, forged or extruded parts may be covered with this stable, nonflammable material.

4. Hydraulic Press

A 300-ton self-contained all hydraulic press designed for exceptionally deep drawing is announced by Hydraulic Press Mfg. Co., Mt. Gilead, O. This new

press has an opening of 118 in. and a stroke of 54 in. Pressing surfaces measure 48 x 48 in. The machine is equipped with a 125-ton hydraulic blank-holder and an 84-ton die cushion in its bed.

5. Internal Radius Tools

Development of a standard line of internal radius tools and blanks for rounding corners of machine parts is announced by Kennametal Inc., Latrobe, Pa. As supplied, they are form ground to hold contour when reground on the top surface only. Sizes are available for forming radii from 3/32 to ½-in.

6. Oil Filter

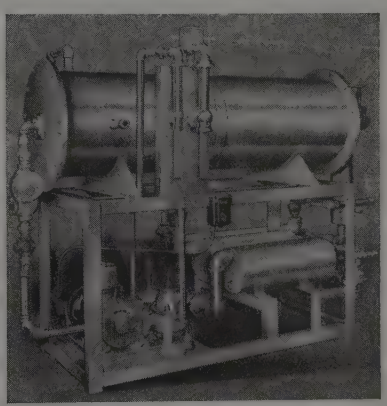
Replacement filters consisting of lint-free textiles wrapped in a closely knit muslin, pressure wound around a perforated metal core and covered with a heavy tubing are manufactured by Engine-Life Products Corp., El Monte, Calif. Horizontal flow of oil from outside to inside through the laminated construction materially increases dirt and sludge removal. Replacement elements are available in 260 different sizes to fit all makes of filter cases.

7. Roof Ventilator

A "straight through" type power roof ventilator in five sizes and a wide range of capacities is offered by Swartwout Co., Cleveland. Called the Ject-O-Valve, it uses a propeller type fan to exhaust heat, smoke, fumes, etc. through a divided top which opens and closes automatically. Ventilator is weather tight at all times.

8. Gas Producer

Generating a prepared atmosphere by partially burning through an exothermic reaction—natural, artificial or propane gas—a gas producer announced by Bellevue Industrial Furnace Co., 2971 Belle-



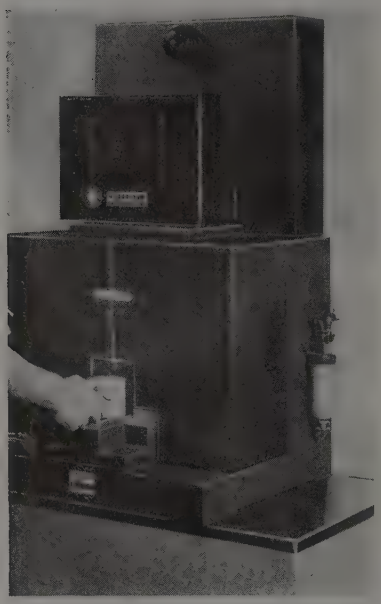
vue, Detroit 7, uses a micrometer adjusting valve to control the air-gas ratio to produce the desired atmosphere. Air-gas mixture is passed through a fire check valve and into a special burner and burned within the primary and secondary combustion chambers.

Combustion chambers are provided with a water-jacket which contributes to long life of refractory lining. Atmospheres having higher hydrogen content of 5 to 10 (air) to 1 (natural gas) may be provided by use of a special catalyst in the secondary combustion chamber. Unit is built to generate 350, 650, 2000, 3500, 9000 and up to 60,000 cu ft per hour for use in bright or clean annealing, sintering

of low carbon steel mixtures or nonferrous mixtures as used in powder metallurgy.

9. Air-Electric Gage

Inspection of critical dimensions of automotive pistons as well as eight classifications are combined into one operation on the Airlectric Multichek gage developed by Sheffield Corp., Dayton, O. Operator merely loads and unloads parts,



segregation into classifications being made by color stamping during the gaging cycle.

When in gaging position, pistons are checked for average diameter of pin holes at each of two bearings, diameters of four ring grooves, widths of five ring grooves and diameter of bottom skirt. In addition, three classifications of pistons are made automatically on basis of average diameter of the pin hole.

Ring groove widths are checked with go and no-go gaging members, each dimension having its own set of red and green signal lights. A bell rings when all dimensions are within specified tolerance limits.

10. Blueprint Machine

Utilizing the revolving contact principle for providing slip-free and static free contact between the tracing and sensitized material, the new model M4 automatic blueprint machine, manufactured by Paragon-Revolute Corp., 77 South avenue, Rochester 4, N. Y., will make blue, white and vandyke prints as well as blueline prints. Accurately machined and jig-drilled aluminum frames have permanently aligned bearings, rollers and other working parts.

Machine uses either a 75 or 95 w quartz lamp, to provide uniform light. Average distance from lamp to print is only 4⅞-in. and 300 degrees of direct printing rays are used. Aperture control governs exposure area of contact glass. Drive mechanism provides infinite speeds from 6 in.

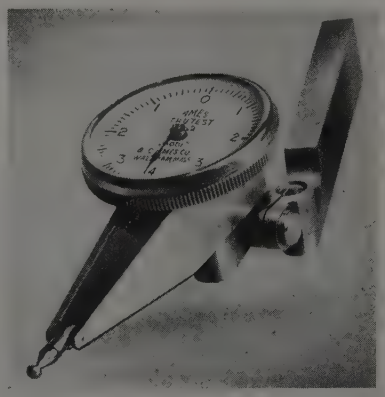
to 32 fpm. Double chemical applicator makes possible complete submersion of prints in chemical solution to assure thorough development and fixing at any speed. Machine also has washer, temperature control, threader and concealed air dryer.

11. Fire Extinguisher

Holding 10 oz of CO_2 in a steel cylinder which has a valve with handwheel and a detachable, flexible hose, a Power-Pak fire extinguisher also is capable of inflating automobile tires. Made by Power-Pak Products Inc., Buffalo 2, it is rechargeable and weighs 2 lb 6 oz.

12. Indicator Gage

Automatic reversible action which eliminates the tripping of a latch in changing from "over" to "under" work is a feature of the Trutest universal indicator manufactured by B. C. Ames Co., Waltham 54, Mass. Regardless of whether



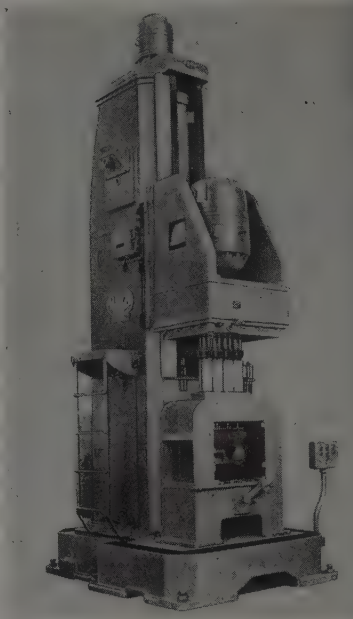
the top or the bottom of the contact point is in use, the indicator hand is always moving in a clockwise direction.

Attached by screw threads, the contact finger is easily swiveled to the desired angle which is maintained without slippage. Dial is 1⅞-in. in diameter.

Two contacts are furnished, 0.001 and 0.031-in. in diameter. Support bars, ¼-in. wide for tool post work and ⅛-in. wide for height gage work are furnished. Gage is available in two models: No. 1, reading in 0.0005-in. with 0-15-0 dial; and No. 2, reading in 0.0001-in. and with 0-4-0 dial.

13. Cylinder Boring Machine

Designed for cylinder boring of replaceable sleeve liners, the Holestee vertical machine developed by National Automatic Tool Co. Inc., Richmond, Ind.,



is arranged with hydraulic feed and a fixed center-gear driven head containing four spindles. The part worked in this application is a cylinder and crankcase of cast iron and production rate is 28 parts per hour.

Machine is arranged to combination rough and finish bore four cylinder bores to 3.781 in. diameter, and counterbore to 4.001 in. diameter. It utilizes a jump feed to combination rough and finish bore lower holes to 3.719 in. diameter and chamfer 15 degrees by ¼-in. deep.

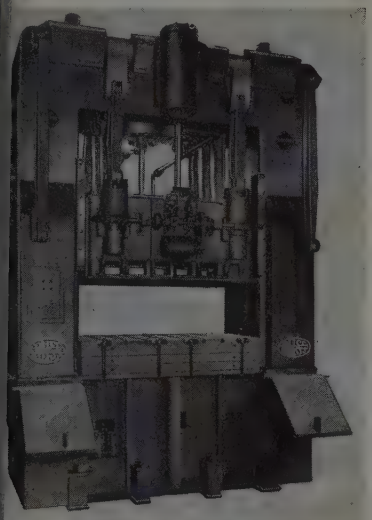
14. Drawing Press

Triple action drawing of large stampings in a wide range of capacities and in any widths desired is possible with the new toggle press line announced by E. W. Bliss Co., Detroit. Presses have four point suspension on both the upper slides which are accurately timed and mechanically locked with a crank-driven plunger in the bed.

Location of driving mechanism below

bed permits a reduction in the height the machine above the floor. With le geared driving mechanism consist- essentially of motor, drive shaft and rmediate gearing, the lower plunger driven by two main crankshafts sup- ted by individual crowns beneath the ss bed.

Entire frame is of welded steel con- uction. Illustrated machine is driven



a 75-hp motor directly connected ough the gearing. Total height is 367 , of which 210 in. are above the floor e. This machine has a capacity in s at bottom stroke of 275, 400 and 0 for the blankholder, upper plunger d lower slide. Other models of up to 0 tons capacity are available.

5. Drawing Set

Beam compasses with 8 and 13 in. ams, a 6 in. bow compass, a ruling n and a draftsman's refillable pencil at may be converted into a double point ncil comprise the new industrial draw- g set introduced by Charles Bruning . Inc., 4754-18 Montrose avenue, Chi- go. Materials used in construction are tin finish aluminum, chromium plated eel and spring steel.

6. Hydraulic Test Machine

Of 20,000 lb capacity and designed r mass production testing, the model -10 Sonntag universal hydraulic testing achine made by Baldwin Locomotive Vorks, Philadelphia 42, has open front ips with replaceable file inserts in the edges. Main frame is a tubular steel sec- on 12 in. diameter with upper front cut ut for placement of gripping heads. pper head is suspended by means of wo hexagonal rods forming a cage with he top head which in turn is guided by oller bearings and actuated hydraulical- ly for vertical movement.

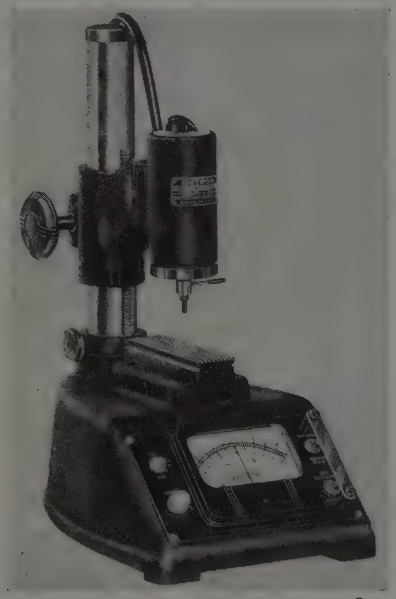
Gripping heads are counter balanced and spherically suspended for axial load- ing, but restrained against excessive tilt- ing while operating grip handles. Non- pulsating hydraulic power unit has vari-

FOR MORE INFORMATION
on products and equipment described in this section, fill in a card following page 128.

able fluid discharge speed control and instantly reversible direction of head mo- tion. Motor and pump are mounted on rubber in lower shell of machine. Vertical distance between gripping heads is ½ to 8½-in., including stroke. Machine is also made in 4000 and 10,000 lb models.

17. Comparator Gage

An electromagnetic type comparator gage with four ranges of magnification enabling each gage to be suitable for a wide range of applications from checking



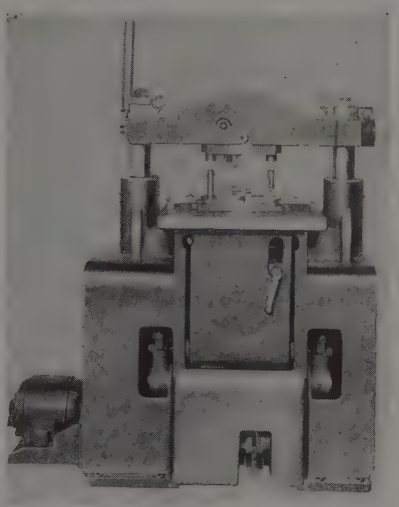
gage blocks to production inspection of machined parts is offered by Metron Instrument Co., 436 Lincoln street, Den- ver 9. Three models are being offered— calibrated in either English or metric units.

Model 10 has a gaging range of 1 millionth inch to 4 ten-thousandths; mod- el 20 from 10 millionths to 5 thousandths; and model 30 from one-half a ten-thou- sandth to 20 thousandths inches.

Spindle pressure is adjustable and cali- brated from 4 oz to 2½-lb. Head may be rotated at any angle about the column, in the vertical plane or may be removed for special setups. It has only two mov- ing parts—the spindle and the pointer. Accessories such as anvils, stops, flat tips, etc. are also supplied.

18. Die Tryout Press

Trying of dies under actual produc- tion conditions, making finishing easier, faster and more accurate, is possible



with the model 40 die tryout press, manu- factured by Alpha Tool Works, 6460 Beechton, Detroit 10. The press, which also can be used for production work, reveals necessary corrections that are often not detected until the die has been shipped.

Finishing work can be performed on both the male and female members of the die without removing them from the press. Position pins retract with a crank, allowing bolster and head to be tilted so that die is made accessible. Capacity of press is 40 tons, stroke 3¾-in., maxi- mum and minimum shut heights are 8 and 6 in., respectively, and clearance between columns is 27 in. It is capable of 100 strokes per minute.

19. Bench Plate

Accurate to 0.00005-in., a new, all- granite 12 x 18 in. bench plate manu- factured by Herman Stone Co., Dayton 2, O., is nonabrasive, nonmagnetic, temperature resistant, rust proof and corrosion proof. It is a straight-sided plate and easy to handle.

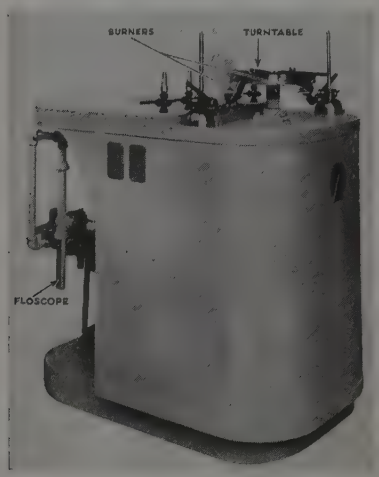
20. File Lights

Fluorescent lights which illuminate fil- ing operations with the full intensity of daylight are manufactured by W. H. Long Co., 425 North Clark street, Chi- cago. Called File-By-Lites, they are designed to rest on top of any file, are stable and have a flat surface to provide a working plane so that work can move

along with the light. Lights are available in three sizes to illuminate one, three or five files with one unit.

21. Heat Treating Table

Heat treating operations such as annealing, hardening, silver-brazing, soft soldering, etc., may be performed at production speeds on a heat-treat table designed by Selas Corp. of America, Philadelphia 34. A revolving variable speed



jig table accommodates work pieces of many sizes and shapes.

Illustration shows two Superheat burners with a turn down ratio of 40 to 1, adjustable to any position. Additional burners or different types of burners may be supplied. Air and gas pass through visual flowmeters to a combustion controller to maintain fuel at the particular proportions and pressure required by the job. An automatic fire check guards the mixture line.

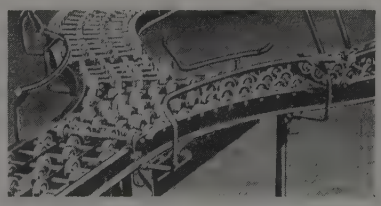
22. Curved Surface Sander

Machine sanding of curved metal surfaces is possible with the sponge rubber sanding pad made to fit the model 1000 portable electric sanders manufactured by Sterling Tool Products Co., 363 East Ohio street, Chicago 11. Pad is surfaced with a 1 in. thickness of oil resistant cellular sponge rubber, over which the abrasive sheet is placed, enabling sanding of convex and concave surfaces.

23. Y-Switch Conveyor Chute

Flow of conveyorized materials may be directed through to two possible destinations with the new Y-switch curve developed for use with conveyors made by Rapids-Standard Co. Inc., Grand Rapids 2, Mich. Its lines curve 45 degrees in opposite directions. Curve sections may be added to make possible erection of two lines diverging 90 degrees from the main line or two lines parallel to the main line.

Control of switch curve is effected by a manually-operated lever which actuates lever-and-cam mechanism to raise a steel switch plate on which is positioned a set of independently mounted conveyor



wheels. Unit is manufactured in standard 12 and 18 in. widths, and may be supported on adjustable stands similar to those used on straight conveyor sections made by the company. Adjustable guard rails are furnished.

24. Soap Dispenser

Allowing a predetermined, measured amount of soap to be dispensed, an enameled cold rolled steel soap dispenser, offered by West Disinfecting Co., 42-16 West street, Long Island City 1, N. Y., is clog proof and easily cleaned. View window permits checking amount of soap remaining in dispenser. It can be adapted for use on Bradley Washfountains.

25. Lift Truck Pallets

Constructed of 5/8-in. plywood decks and posts of metal or plywood blocks, a line of lift truck pallets is announced by Clark Tructrator Division of Clark Equipment Co., Battle Creek, Mich. All are double faced, designed for 4-way fork entry and for use with hand lift or motorized pallet trucks. Sizes range from 30 x 40 in. and 2 in. vertical clearance to 48 x 60 in. with 3 3/4-in. clearance. Capacities are 4000 lb carrying load and 16,000 lb static load.

26. Universal Joint Couplings

Double Morflex universal-joint type couplings which are in effect two single couplings with a center plate adapter,

are manufactured by Morse Chain Co., Detroit 8 and Ithaca, N. Y. This model has twice the torsional resilience or softness of the single coupling, this being obtained through the preloaded neoprene biscuit construction.

Acting as a universal drive connection, the double coupling accommodates offi and angular misalignment of shafts. U permits constant velocity between driv and driven members. Coupling is av able in 10 sizes in capacities of 13 725 lb of torque.

27. Temperature Indicator

Developed for logging large nu bers of thermocouple temperatures in short time, the Speedomax indicat built by Leeds & Northrup Co., 49 Stenton avenue, Philadelphia 44, P

high sensitivity and accuracy, even f low temperatures and short ranges. T read a temperature, the operator flip a key switch marked for the desire thermocouple, the instrument's drum sca spins, stopping at the correct temper ture.

Switching arrangements may be in cluded to meet the needs of practicall any application. One instrument ma handle more than 100 thermocouple For convenience in identifying point key switches may be color-coded. In dicator uses the same case as strip cha Micromax and Speedomax recorders.

28. Rubber Mat

A platform rubber mat in a pebble design on the back which pillars it 1/8 in. above the floor is announced by F. Goodrich Co., Akron. Suitable fo industrial applications where worker must stand in damp or wet places fo long periods, the mat has a top desig that is corrugated or pyramid. Mats ar made in sizes from 24 x 24 in. to 72 in by 14 ft.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in this card. It will receive prompt attention.

Helpful Literature

44. Welding Controls

General Electric Co.—2-page illustrated bulletin No. GEA-4175-A presents data on easily installed and adjusted thyratron welding controls for producing consistent welds and saving welding time. Applications, description, adjustment, operation and ratings are covered.

45. Lubricant Research

Gulf Oil Corp.—24-page illustrated brochure entitled "Better Lubricants for Industry through Research" presents panorama of lubricant development ranging from modern techniques of oil discovery through refining, analysis, testing and creating of new products.

46. Fastening Devices

B. F. Goodrich Co.—40-page illustrated data book No. 7197 describes construction of each of regular and special type Rivnuts; lists sizes, dimensions and grip range identifications; and details installation methods and tools required. Rivnuts are made of aluminum, steel and brass.

47. Electric Fans

Emerson Electric Mfg. Co.—28-page illustrated catalog No. X5749 covers complete line of electric fans. Given are design and construction specifications, performance data and dimensional information on desk fans, air circulators, ceiling fans, kitchen ventilators, exhaust and cooler fans.

48. Portable Air Compressor

Davey Compressor Co.—4-page illustrated bulletin form No. E-216 presents detailed information on 60, 105, 160, 210 and 315-cubic foot per minute portable air compressors. Permanent Peak Efficiency valves and new Equi-Balanced crankshaft that employs two throws and spreads working strokes evenly over 360 degrees of crankshaft rotation are described.

49. Refractory Skid Rails

Carborundum Co.—20-page illustrated booklet form No. 5110 discusses Carbofrax refractory skid rails which are made of silicon carbide material. Their applications in wide variety of industrial furnaces are described and shown by blueprint-type drawings. Detailed drawings of both round-top and flat-top rail units are shown.

50. Surface Protection

Rust-Oleum Corp.—20-page illustrated bulletin form No. 145 describes features of Rust-Oleum for stopping and preventing rust. Typical applications in railroad industry and color swatches of eight colors available are shown.

51. Electric Welding Units

John A. Kern—2-page illustrated data sheet and four supplementary specification and instruction sheets describe line of 200, 300 and 400-ampere, 220-440-volt, 60-cycle industrial electric welders. Features are outlined, specifications are given and construction is described.

52. Rack Coating

Peninsular Chemical Products Co.—4-page illustrated bulletin describes Pen-Kote 590 noninflammable, odorless Saran base rack coating which withstands chlorinated degreasing solvents as well as all plating and cleaning solutions. Material is applied by hand dipping.

53. Hose Couplings

Kelly Machinery Co. — 6-page illustrated catalog No. 112 gives specifications of line of universal type quick detachable pneumatic hose couplings, clamps, menders and nipples. Also included is 8-page folder which lists dimensions and shows typical air hose fittings.

54. Oil & Gas Burning Equipment

Hauck Mfg. Co.—12-page illustrated catalog No. 1043 presents data on line of oil and gas burning equipment for foundries for cupola lighting, mold drying, ladle heating, core baking and furnace heating.

55. Mobile Swing Boom Crane

Silent Hoist & Crane Co.—4-page illustrated bulletin No. 69 contains principal specifications of Krane Kar mobile swing boom crane with capacities of 1¼, 2½, 5 and 10 tons. One-man operation, single engine power plant and pneumatic-tired chassis are among features.

56. Drilling Equipment

Canedy-Otto Mfg. Co.—10-page illustrated insert No. 90 presents information on line of drilling machines that includes 16 and 21-inch box column sliding head floor drills, and wide range of bench and radial type drills. Specifications are given and features of each type machine are set forth.

57. Magnetic Crane Controls

Westinghouse Electric Corp.—20-page illustrated bulletin No. B-3853 describes alternating current magnetic crane controls for handling any type load. Descriptive information, wiring diagrams, performance curves and application guide to aid in selection of controls are included.

58. Press Brake

Dual Press Co.—8-page illustrated bulletin describes line of all-steel press brakes for forming, bending, blanking and multiple punching. Thirty models are described by specification table. Features are outlined.

59. Information on Aluminum

Aluminum Co. of America—20-page illustrated 1946-47 booklet describes series of instructional sound motion pictures, visual aids and booklets available on aluminum, its history, uses, fabrication and features. Helpful suggestions are included for making best use of material.

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60. Overhead Traveling Cranes

Victor R. Browning & Co.—28-page illustrated booklet describes Browning electric overhead traveling cranes in range of capacities from 3 to 150 tons. Installation pictures and detailed parts illustrations show features of design and construction. Rebuilding service is described also.

61. Oil Cooling Equipment

Bell & Gossett Co.—16-page illustrated catalog section describes self-contained oil cooling equipment for controlled quench oil cooling. Installation diagrams, methods of figuring cooler selection and technical operating data are included. Junior and portable equipment are described also.

62. Locating Microscope

Moore Special Tool Co.—8-page illustrated bulletin describes Moore locating microscope, an optical pick-up instrument for Moore jig borer and jig grinder. Specifications, applications and instructions for use are given.

63. Electric Plants

D. W. Onan & Sons—12-page illustrated publication "Power Points" is issued bimonthly and carries news and descriptions of line of electric plants which range from 350 watts to 35 kilowatts. Applications for power generation in all types of industries and in many types of mobile equipment are shown.

64. Roller Bearings

McGill Mfg. Co.—6-page illustrated bulletin No. CF-40-B describes cam follower full type roller bearings for increased speeds and high load carrying capacity. Specifications, load capacity tables, dimensional data, applications and features are included.

65. Gasoline-Electric Welder

Hobart Brothers Co.—4-page illustrated bulletin No. J-1833 describes four models of 200-ampere gasoline engine driven arc welders. Designed for use in the field, this welder embodies remote control, 1000 combinations of welding heat and polarity control.

66. Electric Laboratory Furnace

Boder Scientific Co.—1-page illustrated leaflet presents data on Lindberg 2600-2800F electric laboratory furnace. With working chamber measuring 12 x 6½ x 4½-inches, unit can be used as box furnace, muffle furnace or with diamond blocks for nonoxidizing neutral atmospheres at elevated temperatures.

67. Flexible Tool Holder

Burg Tool Mfg. Co.—4-page illustrated folder describes line of Tool-flex oil resistant, Neoprene mounted, positive drive flexible tool holders that correct misalignment, cut set-up costs, reduce tool breakage and bell mouthing, eliminate chatter and reduce rejects. Complete data and prices are given.

68. Open Hearth Operation

Air Reduction Sales Co.—8-page illustrated technical article entitled "Use of Oxygen in the Open Hearth" discusses possibilities of increasing production by firing oxygen with regular fuel during meltdown. Experimental applications are being carried on to test economic value of process and this article is progress report to date.

69. Heavy Duty Straddle Truck

Hyster Co.—16-page illustrated booklet form No. 1061 describes type MH heavy duty straddle truck especially designed for mills, docks, warehouses and industrial plants. This 30,000-pound capacity unit is powered by 100-horsepower engine, has five speeds forward and five speeds reverse, and is mounted on pneumatic tires.

70. Refrigeration Systems

Worthington Pump & Machinery Corp.—24-page illustrated bulletin No. C-1100-B14 presents information on all elements of centrifugal refrigeration systems for industrial processing of brines, oils and other liquids and for cooling water for air conditioning systems. Equipment specifications and operating characteristics are discussed.

71. Industrial Truck Safety

Associated Factory Mutual Fire Insurance Co.—4-page publication No. 11.24 entitled "Industrial Trucks and Tractors —Fire Hazards" discusses safe operation; recommended limitations of use; approved types and standards; collision with piping; and operation and maintenance of battery powered and gasoline powered trucks.

72. Cutting Tools

Melin Tool Co.—73-page illustrated catalog covers complete line of end mills, router bits, center drills, countersinks, counterbores, die sinking cutters, corner rounding tools and special tools. Of special interest is line of three-flute single end mills in all styles and sizes. Twenty-seven pages of engineering data are included.

73. Rotary Car Dumpers

Link-Belt Co.—20-page illustrated book No. 2048-A presents installation photographs, data and schematic drawings of rotary mine car and railroad car dumpers in wide range of sizes, types and capacities. Refuse car dumpers are covered also.

74. Contract Manufacturing

Bunell Machine & Tool Co.—4-page illustrated folder describes design and manufacturing facilities available for contract work. List of machines available is given.

75. Electric Fork Lift Truck

Automatic Transportation Co.—6-page illustrated bulletin No. 1006 presents information on Skylift electric fork lift truck with maximum lift of 130 inches. Unit lifts, tiers and moves up to 4000 pounds. Operation is similar to conventional automobile. Complete specifications and information on construction and mechanical features are given.

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Seasonal Influences Seen Check on Steel Demand

Vacation shutdowns of many plants may figure in demand-supply situation with some buyers asking deferred shipments. Steady improvement in supply expected over remainder of year. Scrap shows signs of returning strength

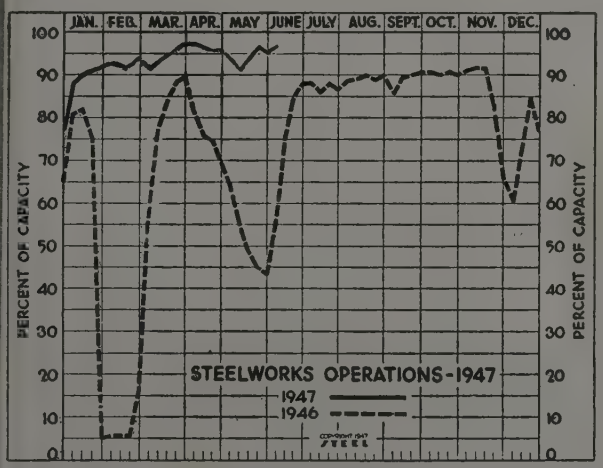
STRONGER tone in the scrap iron and steel market, noted a week ago, continues with prices tending upward again in the East and at Pittsburgh. Buying, however, is on the conservative side and the renewed strength lacks the vitality of a spirited demand.

Whether an actual turn has come in this market is yet to be determined. Some feverish covering by dealers with low stockpiles is reported and a few small sales above $30 for heavy melting grades have been made, but otherwise the show of strength appears superficial with the steel mills still taking in substantial tonnages from consumer connections.

Despite continued strong demand for steel products of all kinds, seasonal influences are beginning to exert something of a check on activity. More consuming plants than ever before are planning complete suspension of operations during vacation periods, which range up to two weeks.

Especially important, in this connection, is the fact some consumers are requesting no steel be shipped them during the period of inactivity. In a few instances requests have been made for extra shipments prior to vacation suspensions. As a general thing, the mills cannot comply with these. Furthermore, most mills are not disposed to hold up shipments for a week or two, preferring to channel material elsewhere. As a result some plants ordering suspensions may lose tonnage.

Efforts are being made to effect vacation suspensions early in July so as to include July 4 and fall at a time when the soft coal mines may be idle in another of the periodic labor disputes which have plagued this industry in recent years.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended June 7	Change	Same Week 1946	Same Week 1945
Pittsburgh	101.5	— 1.5	40	90
Chicago	96	+ 0.5	61	95
Eastern Pa.	93	+ 4	57	92
Youngstown	93	None	30	85
Wheeling	89	+ 7.5	65	95.5
Cleveland	96	+ 2.5	72	91
Buffalo	88.5	None	79	90.5
Birmingham	99	None	54	26
New England	95	None	80	90
Cincinnati	85	— 2	82	89
St. Louis	82	+13.5	54.5	73
Detroit	90	None	79	83
Estimated national rate	96.5	+ 1	55	90

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

As midyear approaches the view is widely advanced that the last six months of 1947 will experience progressive improvement in demand-supply conditions in most products. One exception, however, is the flat-rolled products, no substantial change in this area of the market being likely before next year. Last week a prominent steel company executive told purchasing agents meeting in New York, supply-demand balance in most products will be attained by year-end provided production continues above 90 per cent of capacity. He also predicted no significant fluctuation in prices. Another steel leader estimated there will be a 4 million ton shortage in finished steel during the next 12 months, half of it in sheets and strip.

Steelmaking operations rose 1 point last week to 96½ per cent of capacity, only ½ point below the all-time peacetime high and marking the 22nd consecutive week during which the rate has been above 90 per cent. Last week's schedule was equivalent to production of over 1,650,000 net tons.

Production was 4 points higher in eastern Pennsylvania at 93 per cent, ½ point higher in Chicago at 96 per cent, 2½ points higher in Cleveland at 96 per cent, and 7½ points higher in Wheeling at 89 per cent. Settlement of labor difficulties in the St. Louis district resulted in a sharp rise of 13½ points there to 82 per cent. Operations were 1½ points lower in Pittsburgh at 101½ per cent and 2 points lower in Cincinnati at 85 per cent. Elsewhere operations held unchanged.

Continued high rate of ingot production was one of the chief factors in further strengthening the scrap market. STEEL's composite price average on steelmaking scrap increased to $30.08 from $29.92 the previous week. Other composite market averages held unchanged at $69.82 for finished steel, $52.10 for semifinished steel, and $32.49 for steelmaking pig iron.

COMPOSITE MARKET AVERAGES

	June 7	May 31	May 24	One Month Ago May, 1947	Three Months Ago Mar., 1947	One Year Ago June, 1946	Five Years Ago June, 1942
Finished Steel	$69.82	$69.82	$69.82	$69.82	$69.82	$64.09	$56.73
Semifinished Steel	52.10	52.10	52.10	52.10	52.10	40.60	36.00
Steelmaking Pig Iron	32.49	32.49	32.49	32.49	32.40	27.50	23.00
Steelmaking Scrap	30.08	29.92	29.42	29.75	37.25	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	June 7, 1947	May, 1947	Mar., 1947	June, 1946
Steel bars, Pittsburgh	2.60c	2.60c	2.60c	2.50c
Steel bars, Philadelphia	2.98	2.98	2.98	2.82
Steel bars, Chicago	2.60	2.60	2.60	2.50
Shapes, Pittsburgh	2.50	2.50	2.50	2.35
Shapes, Philadelphia	2.64	2.64	2.64	2.465
Shapes, Chicago	2.50	2.50	2.50	2.35
Plates, Pittsburgh	2.65	2.65	2.65	2.50
Plates, Philadelphia	2.85	2.85	2.85	2.55
Plates, Chicago	2.65	2.65	2.65	2.50
Sheets, hot-rolled, Pittsburgh	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Pittsburgh	3.55	3.55	3.55	†4.05
Sheets, hot-rolled, Gary	2.50	2.50	2.50	2.425
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.275
Sheets, No. 10 galv., Gary	3.55	3.55	3.55	†4.05
Hot-rolled strip, Pittsburgh	2.50	2.50	2.50	2.35
Cold-rolled strip, Pittsburgh	3.20	3.20	3.20	3.05
Bright basic, bess. wire, Pittsburgh	3.425	3.425	3.425	3.05
Wire nails, Pittsburgh	4.125	4.125	4.125	3.50
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$50.00	$50.00	$50.00	$38.00
Slabs, Pittsburgh, Chicago	42.00	42.00	42.00	39.00
Rerolling billets, Pittsburgh	42.00	42.00	42.00	39.00
Wire rods ⅜ to ¼-inch, Pitts.	2.55c	2.55c	2.55c	‡2.30c

‡ Base, No. 5 to ⅜-in.

Pig Iron

	June 7, 1947	May, 1947	Mar., 1947	June, 1946
Bessemer, de., Pittsburgh	$34.83	$34.83	$34.83	$29.6
Basic, Valley	33.00	33.00	33.00	28.0
Basic, eastern del. Philadelphia	35.52	35.52	34.26	27.8
No. 2 fdry., del. Pgh. N. & S. sides	34.33	34.33	34.33	29.1
No. 2 fdry., del. Philadelphia	36.02	36.02	34.76	28.3
No. 2 foundry, Chicago	33.00	33.00	33.00	28.5
Southern No. 2 Birmingham	29.88	29.88	29.28	22.8
Southern No. 2, del. Cincinnati	34.75	34.75	34.15	26.9
Malleable, Valley	33.50	33.50	33.50	28.5
Malleable, Chicago	33.50	33.50	33.50	28.5
Charcoal, low phos., fob Lyles, Tenn.	40.50	40.50	40.50	33.0
Gray forge, del. McKees Rocks, Pa.	33.66	33.66	33.66	28.5
Ferromanganese, fob cars, Pittsburgh	140.25	140.25	140.25	140.0

Scrap

Heavy melting steel, No. 1, Pittsburgh	$30.00	$30.00	$37.25	$20.00
Heavy melt. steel, No. 2, E. Pa.	29.50	28.35	38.50	18.75
Heavy melt. steel, Chicago	28.75	29.25	35.125	18.75
Rails for rerolling, Chicago	34.00	34.50	40.75	22.25
No. 1 cast, Chicago	35.50	36.90	43.25	20.00

Coke

Connellsville, furnace ovens	$9.125	$9.125	$8.875	$8.75
Connellsville, foundry ovens	10.625	10.375	10.375	9.50
Chicago, by-product fdry., del.	16.10	16.10	16.10	13.75

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality, $40, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown. **Alloy Steel Ingots:** Pittsburgh, Canton, $52.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $42; Portsmouth Steel Corp., $55-$60, Portsmouth, O. Detroit, del., $45; eastern Mich., $46.

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $50; Detroit, del., $53; eastern Mich., $54.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $61; del. Detroit $64; eastern Mich., $65.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $50; Portsmouth Steel Corp., $66, Portsmouth, O.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.35c per lb.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, ⅜ to ¼-in., inclusive $2.55-$2.80 per 100 lb. Galveston base, $2.65. Worcester, add $0.10. San Francisco (base, del.), $3.27.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.60c; Detroit, del., 2.75c; eastern Mich., 2.80c; New York, del., 3.01c; Phila., del., 2.98c; San Francisco (base, del.), 3.33-3.65c; Los Angeles (base, del.), 3.325-3.56c; Seattle, 3.285c, base.

Rail Steel Bars: Price, 2.60c-2.95c, same basing points as merchant carbon bars, except base is 10 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.05c; Detroit, del., 3.20c; eastern Mich., 3.25c (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.20c; Detroit, 3.35c; Toledo, 3.40c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 3.80c; Detroit, del., 3.95c; eastern Mich., 4.00c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.45c; San Francisco (base, del.), 3.03c; Los Angeles (base, del.), 3.025c; Seattle, 2.985c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.60c-2.95c.

Iron Bars: Single refined, Pittsburgh, 6.15c-†6.70c; double refined, 7.00-†8.50c; Pittsburgh, staybolt, 7.85c-†10.00c.

† Hand puddled.

Sheets

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c; Philadelphia, del., 2.70c; New York, del., 2.79c; Los Angeles (base, del.), 3.24c; San Francisco, (base, del.), 3.245c. (Andrews Steel Co., quotes Middletown, O., base for shipment to Detroit; Alan Wood Steel Co., Conshohocken, Pa., quotes 3.10c, Sparrows Point, Md., base; Granite City Steel Co., 2.875c, fob Granite City, Ill., 2.775c, fob Gary or Birmingham.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.20c; Granite City, base, 3.30c; Detroit, del., 3.35c; eastern Mich., del., 3.40c; New York, del., 3.61c; Philadelphia, del., 3.58c.

Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, Sparrows Point, Canton, Middletown, base 3.55c; New York, del., 3.84c; Philadelphia, del., 3.75c; Los Angeles (base, del.), 4.32c; San Francisco (base, del.), 4.325c.

Corrugated Galvanized Sheets, No. 10: Pittsburgh, Chicago, Gary, Birmingham, base, 3.55c.

Culvert Sheets, No. 16, corrugated: Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.15c; copper-iron or pure iron, 4.50c. Granite City base prices 10 points higher. Los Angeles (base, del.), 4.94c; San Francisco (base, del.), 4.945c.

Aluminized Sheets, No. 20: Hot-dipped, coils or cut to lengths: Pittsburgh, 9.00c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.55c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.55c; Granite City, base, 3.65c; Detroit, del., 3.70c; eastern Mich., 3.75c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.20c; Kokomo, Ind., 4.30c. Armature: Pittsburgh, Chicago, Gary, 4.50c; Granite City, Ill., Kokomo, Ind., 4.60c. Electrical: Pittsburgh, Chicago, Gary, 5.00c; Granite City, Kokomo, 5.10c. Motor: Pittsburgh, Chicago, Gary, 5.75c; Granite City, 5.85c. Dynamo: Pittsburgh, 6.45c; Granite City, 6.55c. Transformer 72, 6.95c; 65, 7.65c; 58, 8.35c; 52, 9.15c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.50c; Detroit, del., 2.65c; eastern Mich., del., 2.70c. (Superior Steel Corp., 3.30c, Pittsburgh.)

Cold-Rolled Strip, 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.20c; Chicago, base, 3.30c; Detroit, del. 3.35c; eastern Mich., 3.40c; Worcester, base, 3.40c. (Superior Steel Corp., 4.70c, Pittsburgh.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.20c; over 0.40 to 0.60 carbon, 4.70c; over 0.60 to 0.80, 5.30c; over 0.80 to 1.00, 6.80c; over 1.00, 9.10c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.60c; Granite City, Birmingham, Sparrows Point, 3.70c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh base per package (112 sheets; 20 x 28 in., coating I.C. 8-lb $13.50; 5-16 $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.65c; Coatesville, Claymont, Geneva, Utah, 2.80c; New York, del. 2.94c; Phila., del., 2.85c; St. Louis, del., 2.47c; Boston, del., 2.86c; San Francisco and Los Angeles, del., 3.29c-3.46c.

Central Iron & Steel Co., Harrisburg, Pa., 2.85c, basing points; Alan Wood Steel Co., Conshohocken, Pa., 2.80c, Coatesville and Claymont equivalent.)

Floor Plates: Pittsburgh, Chicago, 3.90c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.787c; Coatesville, 4.15c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.50c; New York, del., 2.70c; Phila., del., 2.64c; Geneva, Utah (base, del), 2.675c; Los Angeles (base, del.), 3.17c-3.41c; Los Angeles and San Francisco (sizes produced at Geneva only), del., 3.14c; Kaiser, del., San Francisco, 3.41c.

(Phoenix Iron Co., Phoenixville, Pa., nominally, 4.00c, fob Phoenixville.)

Steel Piling: Pittsburgh, Chicago, Buffalo, $3 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer.....*$3.30-$3.55

Spring (except Birmingham).....**$4.25

Wire Products to Trade

Nails and Staples

Standard and cement-coated.....†$3.75-$4.50

Galvanized .....‡$3.75-$4.50

Wire, Merchant Quality

Annealed (6 to 8 base) ..... §$3.95

Galvanized (6 to 8 base)..... §$4.40

(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier.... ††84

Barbed wire, 80-rod spool..... ††94

Barbless wire, twisted..... 94

Fence posts (no clamps)..... ††90

Bale ties, single loop..... ††86

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* Worcester, $3.40, Duluth, $3.35, base. San Francisco (base, del.) $4.31 for bright basic only.

** Worcester $4.35, Duluth and Trenton, N. J., $4.50, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.05, Cleveland $3.85, base. San Francisco (base, del.) $4.83.

‡ Duluth $3.75, Cleveland $3.85, base. San Francisco (base, del.) $4.83.

§ Worcester $4.05, annealed; $4.50, galvanized. Duluth $3.95, annealed; $4.40, galvanized base. San Francisco (base, del.) $4.96, annealed; $5.41, galvanized.

†† San Francisco (base, del.): Woven fence, 107; barbed wire, 114; bale ties, 110. Duluth (base): Woven fence, 84; barbed wire, 94; fence posts, 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.50 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $2.85 per 100 lb; light rails (rail steel), $2.95, Williamsport, Pa.

Relaying, 60 lb and over, fob railroad and basing point, $46-$49 per net ton.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates, $2.80 per 100 lb, fob mill; $3.15 base, Seattle. Splice bars, $3 per 100 lb. Standard spikes, 3.65c-4.50c; screw spikes, 5.30-6.40c.

Tubular Goods

Standard Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

Butt Weld

	Steel		Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	48	23	½	— 2	+ 20
¼ & ⅜	51	30½	¾	—11½	+ 10
½	55½	41	1-1¼	—17	+ 2
¾	58½	45	1½	—22½	— 1½
1-3	60½	47½	2	—23	— 2

Lap Weld

	Steel		Iron		
In.	Blk.	Gal.	In.	Blk.	Gal.
2	53	39½	1¼	— 1	+20
2½-3	56	42½	1½	— 7	+13
3½-6	58	44½	2	—14½	+ 5½
*8	58	42½	2½-3½	—17	+ 1½
*10	57½	42	4	—21	— 4
*12	56½	41	4½-8	—19	— 2½
			9-12	—10	+ 7

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* Not T. & C.

Seamless
Steel

In.	Blk.	Gal	In.	Blk.	Gal
2	52	38½	*8	57	42
2½-3	55	41½	*10	56½	42
3½-6	57	43½	*12	55½	41

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* Not T. & C.

Line Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Seamless	In.	Butt Weld
2	51	⅛	47
2½ & 3	54	¼ & ⅜	50
3½ to 8	56	½	54½
10	55½	¾	57½
12	54½	1 to 3	59½

Boiler Tubes: Net base prices per 100 feet, fob Pittsburgh, in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D.		——Seamless—— Hot	Cold	—Elec. Weld— Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"	13	....	$10.89	$10.62	$10.62
1¼"	13	....	12.90	10.59	12.58
1½"	13	$12.00	14.26	11.70	13.90
1⅝"	13	13.65	16.23	13.31	15.82
2"	13	15.29	18.17	15.00	17.95
2¼"	13	17.05	20.26	16.71	20.00
2¼"	12	18.78	22.31	18.38	22.00
2½"	12	20.57	24.43	20.11	24.07
2⅝"	12	21.80	25.89	21.27	25.46
3"	12	22.87	27.18	22.26	26.68
3¼"	11	26.88	31.94	26.15	31.33
3½"	11	28.86	34.30	28.06	33.64
4"	10	35.82	42.55	34.78	41.68
4½"	9	47.48	56.42	....	....
5"	9	54.96	65.30	....	....
6"	7	84.38	100.25	....	....

Pipe, Cast Iron: Class B, 6-in. and over $65 per net ton, Birmingham; $70, Burlington, N. J.; $75.56, del., Chicago; 4-in. pipe, $5 higher, Class A pipe, $3 a ton over class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length 55 off

⅝ and ¾, up to 6 in. in length..... 52 off

¾ x 6 in. ..... 49 off

⅞ and 1 in. x 6 in. length..... 51 off

1⅛ in. and larger in all lengths and ⅞ in. and larger in lengths over 6 in. .. 48 off

½ in. and smaller, longer than 6 in. ... 45 off

Tire bolts .....38½ off

Step bolts ..... 46 off

Plow bolts ..... 57 off

Stove Bolts

In packages, nuts separate, 60-10 off; bulk 74 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅛-in. and smaller.....	51 off	....
½-in. and smaller.....	....	48 off
⅛-in.-1-in.	48 off	....
⅛-in.-1-in.	....	47 off
1⅛-in.-1½-in.	46 off	45 off
1⅝-in. and larger.....	....	44 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

Upset 1-in., smaller (10-20 bright).....	56 off
Upset (10-35 heat treated)	
⅝ x 6	51 off
¾, ⅞, & 1 x 6.....	47 off

Square Head Set Screws

Upset 1-in. and smaller.....	61 off
Headless, ¼-in. and larger.....	46 off
No. 10 and smaller.....	56 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural	5.25c
Lebanon, Pa.	5.40c
⅞-in. and under.....55-5 off	
Lebanon, Pa. .....55-5 off plus 15c per cwt.	

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1.50-$2.00 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per bbl; reg. carbon 16.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	...	74.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	62.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

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* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

PIG IRON

Prices per gross ton	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$34.50	$34.00	$35.50	$35.00
Newark, N. J., del.	36.34	35.84	37.34	36.84
Brooklyn, N. Y., del.	37.50	....	....	38.00
Birdsboro, Pa., base	34.50	34.00	35.50	35.00
Philadelphia, del.	36.02	35.52	37.02	36.52
Birmingham, base	29.88	29.38	34.50	....
Baltimore, del.	36.28	....	....	....
Chicago, del.	34.12	....	....	....
Cincinnati, del.	34.75	34.25	....	....
Newark, N. J., del.	35.96	....	....	....
Philadelphia, del.	35.13	....	....	....
St. Louis, del.	33.87	33.37	....	....
Buffalo, base	33.00	32.50	34.00	33.50
Boston, del.	39.48	38.98	40.48	39.98
Rochester, del.	34.84	34.34	35.84	35.34
Syracuse, del.	35.50	35.00	36.50	36.00
Chicago, base	33.00	32.50	34.00	33.50
Milwaukee, del.	34.32	33.82	35.32	34.83
Muskegon, Mich., del.	36.83	....	....	37.33
Cleveland, fob furnace	33.00	32.50	34.00	33.50
Akron, del.	35.17	34.17	35.67	35.17
Duluth, base	33.50	33.00	34.50	34.00
Erie, Pa., base	33.00	32.50	34.00	33.50
Everett, Mass., base	29.50	29.00	30.50	30.00
Boston, del.	30.00	29.50	31.00	30.50
Granite City, Ill., base	33.50	33.00	....	33.50
St. Louis, del.	34.25	33.75	....	34.25
†Neville Island, Pa., base	33.50	33.00	34.00	33.50
Pittsburgh, del., N. & S. Sides	34.33	33.83	34.83	34.33
Provo, Utah, base	33.50	33.00	....	....
Seattle, Tacoma, Wash., del.	38.60	....	....	....
Portland, Oreg., del.	38.60	....	....	....
Sharpsville, Pa., base	33.50	33.00	34.00	33.50
Steelton, Pa., base	34.50	34.00	35.50	35.00
Swedeland, Pa., base	35.50	35.00	36.50	36.00
Troy, N. Y., base	34.50	34.00	35.50	35.00
Toledo, O., base	33.00	32.50	34.00	33.50
Cincinnati, del.	36.50	36.00	....	....
Youngstown, O., base	33.50	33.00	34.00	33.50
Mansfield, O.	36.48	35.98	36.98	36.48

† To Neville Island base add: 66c for McKees Rocks, Pa.; $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33, Oakmont, Verona; $1.49 Brackenridge.

Exceptions to above prices: Kaiser-Frazer Parts Corp., Struthers, O., charges 50 cents a ton in excess of Sharpsville, Pa., basing point price for No. 2 foundry, basic, bessemer and malleable pig iron.

High Silicon Silvery

6.00-6.50 per cent (base)	$40.50		
6.51-7.00	$41.50	9.01- 9.50	46.50
7.01-7.50	42.50	9.51-10.00	47.50
7.51-8.00	43.50	10.01-10.50	48.50
8.01-8.50	44.50	10.51-11.00	49.50
8.51-9.00	45.50	11.01-11.50	50.50

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Ferrosilicon: Si 14.01-14.50%, $65.75, Jackson, O.; $67, Niagara Falls; $68, piglets, $66, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.... $40.50 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $33.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., Birdsboro, Pa., $39, base; Philadelphia, $41.16, del. Intermediate phosphorus, Central furnace, Cleveland, $36.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$8.75–$9.50
Connellsville, foundry	9.75–11.50
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

* Operators of hand-drawn ovens using trucked coal, $9.35-$10.10.

Foundry Coke

Kearney, N. J., ovens	$15.35
Chicago, outside del.	15.10
Chicago, del.	16.10
Terre Haute, del.	15.60
Milwaukee, ovens	15.85
New England, del.	17.25
Birmingham, Del.	13.25
Indianapolis, ovens	14.50
Cincinnati, del.	15.35
Ironton, O., ovens	13.35
Painesville, ovens	14.60
Cleveland, del.	15.90
Buffalo, del.	16.10
Detroit, del.	15.75
Philadelphia, ovens	14.50
Portsmouth, O., ovens	14.00
Fairmont, W. Va., ovens	13.75
Pittsburgh, del.	15.61

Coal Chemicals

Spot, gal, freight allowed east of Omaha. Effective as of Apr. 1, 1947

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xyloi	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	76.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.	
Bulk	24.00
Single bags	28.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50–6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$27–$28

Manganese Ore

46-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27-$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	3.85	3.75–3.85	...	...	...
Cold-Rolled	4.55–4.75	4.55–4.75	4.55–4.75	4.75	...	4.55–4.75	...	...	...
Galvanized	5.40	.....	.....	...	...	.....	...	...	...
Strip, Hot-Rolled	3.75–3.85	3.75–3.85	3.75–3.85	3.85	...	.....	...	...	...
Cold-Rolled	4.55	4.65	4.65	4.65	...	.....	...	...	...
Shapes, Structural	3.85	3.85	.....	3.85	...	.....	3.85	...	...
Plates	4.10	4.10	4.10	...	4.10	.....	...	...	...
Bars and Bar Shapes	4.00	4.00	4.00	4.00	...	4.00	...	4.00	4.00

Note: Lower level of quoted ranges represent prices for NAX High Tensile, produced by Great Lakes Steel Corp., Detroit.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. •10G	Gal. •24G	†H-R	†C-R	H-R	C-F	H-R Alloy ($4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	4.50	5.67[4]	5.22[4]	5.55[4]	6.80[4]	4.65	6.36	4.62	5.22	7.12	4.47	4.70	6.42
†New York (city)	4.42	....	5.27[3]	5.47[3]	....	4.62	....	4.62	5.17	8.42[13]	4.37	4.72	6.35
New York (country)	4.32	....	5.17[3]	5.37[3]	....	4.52	....	4.52	....	....	4.27	....	6.25
Philadelphia (city)	4.24	5.73[9]	5.33[9]	5.29[9]	6.54[5]	4.43	5.28	4.48	5.38	6.87	4.22	4.44	5.93
Philadelphia (country)	4.14	5.63[9]	5.23[9]	5.19[9]	6.44[5]	4.33	5.18	4.38	....	6.60	4.12	4.34	5.83
Baltimore (city)	4.09	6.15[5]	5.65[5]	5.14[5]	6.39[5]	4.40	...	4.45	5.10	....	4.34	4.39	5.90
Baltimore (country)	3.59	6.05[5]	5.55[5]	....	....	....	....	....	....	....	4.24	4.29	5.80
Washington (city)	4.35	....	....	5.18[5]	6.43[5]	4.65	....	4.70	5.60[11]	....	4.60	4.65	6.60
Norfolk, Va.	4.35	....	....	....	....	....	....	4.75	5.50	....	4.50	4.50	6.25
Buffalo (city)	4.05	....	4.75[6]	5.35[5]	....	4.30	5.25	4.10	4.75	....	4.10	4.65	5.90
Buffalo (country)	3.90	....	4.60[6]	4.95[5]	....	3.90	4.85	3.95	4.60	6.60	3.95	4.20	5.45
Pittsburgh (city)	4.15	5.15[5]	4.85[5]	5.10[5]	6.35[5]	4.05	5.00	4.10	4.75	6.60	4.10	4.25	5.60
Pittsburgh (country)	4.00	5.00[5]	4.70[5]	4.95[5]	6.20[5]	3.90	4.85	3.95	4.60	6.60	3.95	4.10	5.45
Youngstown, O. (city)	4.188	5.338	4.888	5.05	6.30	4.00	....	4.238	5.188	....	4.218	4.488	5.178
Youngstown, O. (country)	....	....	....	4.95	6.20	3.90	....	....	....	....	....	....	....
Detroit	4.15	5.30	4.85	5.42	6.67	4.34	5.24	4.20	4.87[12]	7.01	4.42	4.49	5.92
Cleveland (city)	4.15	5.15[5]	4.85[5]	5.238[5]	6.488[5]	4.188	5.10	4.10	4.75	6.858	4.311	4.25	5.961
Cleveland (country)	4.00	5.00[5]	4.70[5]	....	....	3.90	4.95	3.95	4.60	....	....	4.10	....
Cincinnati	4.116	5.266[5]	....	5.166[5]	....	4.394	....	4.403	5.303	....	4.444	4.553	5.944
Chicago (city)	4.15	5.15[5]	4.85[5]	5.10[5]	6.35[5]	4.05	5.10	4.10	4.75	6.60[13]	4.10	4.25	5.75
Chicago (country)	4.00	5.00[5]	4.70[5]	4.95[5]	6.20[5]	3.90	4.95	3.95	4.60	6.60[13]	3.95	4.10	5.60
Milwaukee	4.299	5.299[5]	4.999[5]	5.249[5]	6.499[5]	4.199	5.249	4.249	4.899	6.899	4.249	4.399	5.899
St. Paul	4.384[1]	5.534[5]	5.084[5]	5.434[5]	6.684[5]	4.404[18]	....	4.434[18]	5.726[11]	7.084[11]	4.434[13]	4.684[19]	6.084[19]
Indianapolis	4.04	....	4.84[5]	5.29[5]	6.54[5]	4.24	....	4.36‡‡	5.26	....	4.36	4.61	6.01
St. Louis	4.299	5.299	4.999[5]	5.424[5]	6.674[5]	4.199	....	4.249	5.074[12]	7.074	4.249	3.999	5.899
Birmingham (city)	3.85[20]	....	....	5.20[5]	....	4.10[20]	....	4.05[20]	5.83	....	4.05	4.30	6.56
Birmingham (country)	3.75[20]	....	....	5.20[5]	....	4.00[20]	....	3.95[20]	....	....	3.95	4.20	....
New Orleans	4.46[2]••	....	5.77[5]	....	....	4.83[20]	....	4.78[2]•••	5.94[11]	....	4.68[2]••	5.03[20]	6.94[20]
Houston, Tex.	5.00[1]	....	....	6.00	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.40
Omaha, Nebr.	4.868	6.118[5]	....	5.918[5]	7.168[5]	4.862	....	4.918	5.818[11]	....	4.918	5.068	6.568
Los Angeles	5.55	....	7.10[5]	....	8.10[5]	5.65	8.35	5.10	6.90[19]	7.85	5.20	5.10	7.20
San Francisco	4.90§§	....	6.30[5]	....	7.35[5]	5.20[14]	8.35[14]	4.75[14]	•••	9.35[18]	4.90[14]	5.00[14]	6.80[14]
Tacoma, Wash.	....	....	....	6.30[5]	....	5.30[17]	....	5.00[17]	7.10[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]
Seattle	5.00[17]	....	....	6.30[5]	....	5.30[17]	....	5.00[17]	7.10[19]	8.50[19]	4.95[17]	5.15[17]	7.25[17]

Base Quantities: 400 to 1999 pounds except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 pounds and over; [1]—any quantity; [2]—300 to 1999 pounds; [3]—150 to 2249 pounds; [4]—three to 24 bundles; [5]—450 to 1499 pounds; [6]—one bundle to 1499 pounds; [7]—one to nine bundles; [8]—400 to 1499 pounds; [9]—1000 to 1999 pounds; [10]—450 to 39,999 pounds; [11]—1000 to 39,999 pounds; [12]—1000 pounds and over; [13]—400 to 14,999 pounds; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999; [17]—300 to 9999 pounds; [18]—1500 to 1999 pounds; [19]—1500 to 39,999; [20]—400 to 3999 pounds.

° Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ basing point cities with quotations representing mill prices plus warehouse spread; § as rolled, except New York, Jersey City, Indianapolis and San Francisco where price represents annealed bars; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier; ••• rounds under ⅜ in. 7.00c, ⅜ in. and over 6.50c, squares, hexagons and flats 6 in. and narrower 7.50c, flats over 6 in. 8.25c at San Francisco.

PRICES OF LEADING FERROALLOYS PRODUCTS

Spiegeleisen: 19-21% Mn, 1-3% Si, carlot per gross ton, Palmerton, Pa., $44; Pittsburgh, $48. 16% to 19% Mn, Pittsburgh, $47.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140.25 fob cars, Pittsburgh, including 75c switching charge, (where Carnegie-Illinois Steel Corp. is producer); add $8 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.30c; regular, 21.20c; medium, 15.20c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) Prices per lb of briquets: Contract, bulk, carlots, 7.00c, packed, carlots, 7.60c, ton lots, 8.00c, smaller lots 8.40c, eastern, freight allowed; 7.25c, 7.85c, 8.60c and 9.00c, central; 7.80c, 8.40c, 10.50c and 10.90c, western; spot up 0.25c; notched, up 0.25c.

Ferrotungsten: Spot, 10,000 lb or more, per lb contained W, $2.27; contract, $2.25; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; smaller lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum C; per lb contained Ti; ton lots $1.35; smaller lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

Ferrovanadium: V 0.35-0.55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 13.80c, ton lots 14.30c, smaller lots 14.80c; 75%, c.l. 11.05c, ton lots 11.65c, smaller lots 12.25c; 50%, c.l. 9.00c, ton lots 9.65c, smaller lots 10.30c. Deduct 1.00c for bulk, carlots, 80-90% and 90-95%; 1.05c, 75%; 1.20c, 50%. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%.

Ferroboron: (B 17.50% max. and C 1.50% max., Al 0.50% max. and C 0.50% max.) Prices per lb of alloy, contract, ton lots $1.20, smaller lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60%, per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.50; smaller lots $2.55. Spot up 10c.

Ferrochrome: Contract, lump, packed; **high carbon,** eastern zone, c.l. 16.20c, ton lots 16.80c; central zone, add 0.40c and 1.30c; western zone, add 0.55c and 2.10c. Deduct 0.60c for bulk carlots. **High carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c. **Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22.00c, 0.2% 21.75c; 0.5% 21.50c, 1% 21.00c, 2% 20.50c; add 1.35c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l.; and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carlot packed differential 0.80c. Prices are per lb of contained Cr, freight allowed.

Low carbon, high nitrogen: Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C above 5-7%.) Contract, 2-inch x D, packed, eastern zone, freight allowed, c.l. 17.05c, ton lots 17.60c, smaller lots 18.30c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, high carbon: (Cr 60-65%, Si, Mn and C 4-6% each.) Contract, lump, packed, eastern zone, freight allowed, c.l. 17.30c, ton lots 17.90c, smaller lots 18.60c; central zone, add 0.40c for c.l. and 1.30c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Prices are per pound of contained chromium, spot prices 0.25c higher. Deduct 0.60c for bulk carlots.

S. M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk 21.00c; packed carlot 21.80c, ton lots 22.35c, smaller lots 23.35c, eastern, freight allowed, per pound of contained Cr; 21.40c, 22.20c, 23.00c, and 24.00c, central; 21.50c, 22.30c, 24.20c and 25.20c, western spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb Cr, packed eastern zone, c.l. 10.35c, ton lots 10.75c, smaller lots 11.15c; central zone, add 0.25c for c.l. and 0.90c for smaller lots; western zone, add 0.55c for c.l. and 2.10c for smaller lots. Deduct 0.50c for bulk carlots. Prices per pound of briquets; spot prices 0.25c higher; notched, 0.25c higher.

Chromium Metal: 97% min. Cr, max. 0.50% C, eastern zone, per lb contained Cr bulk, c.l. 79.50c, 2000 lb to c.l. 80c; central 81c and 82.60c; western 82.25c and 84.75c, fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) Contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract, ton lot or more, $1.60; 100 to 1999 lb, $1.95; less than 100 lb, $3.15 per lb of metal, eastern zone; $1.615, $1.965 and $3.185, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb of alloy. Contract, carlots, packed, 16.10c, ton lots 17.60c, smaller lots 18.60c, eastern, freight

allowed; 16.60c, 18.45c, 19.45c, central; 18.65c, 20.20c, 21.20c, western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, lump, packed, carlots 14.60c, ton lots 16.10c, smaller lots 17.10c, eastern, freight allowed; 15.10c, 16.85c, 17.85c, central; 17.15c, 19.00c, 20.00c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l. 14.50c; 2000 lb to c.l. 16.00c; central zone, 15.10c and 18.25c; western, 15.70c and 20.00c; min. 96% Si and max. 2% Fe, eastern, bulk, c.l. 14.10c; 2000 lb to c.l. 15.60c; central 14.70c and 17.85c; western, 15.30c and 19.60c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese Briquets: Containing exactly 2 lb Mn and about ⅛ lb Si, eastern zone, bulk, c.l. 6.75c, ton lots 7.75c; central zone, add 0.25c for c.l. and 0.60c for ton lots; western, add 0.80c for c.l. and 2.50c for ton lots. Notched, up 0.25c.

Silicon Briquets: Weighing about 5 lb and containing exactly 2 lb Si, packed, eastern zone, c.l. 4.70c, ton lots 5.10c, smaller lots 5.50c; weighing about 2½ lb and containing 1 lb Si, packed, eastern zone, c.l. 4.85c, ton lots 5.25c, smaller lots 5.65c; notched 0.25c higher; central zone, add 0.25c for c.l. and 0.60c for smaller lots; western zone, add 0.45c for c.l. and 0.90c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.50c for bulk carlots.

Manganese Metal: (Min. 96% Mn., max. 2% Fe), per lb of metal, eastern zone, bulk, c.l. 30c, 2000 lb to c.l., 32.00c; central 31.00c and 33.45c; western, 31.45c and 34.40c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) Prices per lb of alloy. Contract, ton lots $1.89, less $2.01, eastern, freight allowed; $1.903 and $2.023, central; $1.935 and $2.055, western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max, Ni, balance). Prices per lb of alloy: Contract, 5 tons or more $1.90, 1 ton to 5 tons $2.00, smaller lots $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si; $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%) Prices per lb of alloy, contract, or spot carlots 35.00c, ton lots 37.00c, smaller lots 39.00c, eastern, freight allowed; 35.30c, 38.10c and 40.10c, central; 35.30c, 40.05c and 42.05c, western; spot up 0.25c.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) Prices per lb of alloy, contract, carlots 13.50c, ton lots 14.25c, smaller lots 15.00c, eastern zone, freight allowed; 13.80c, 15.35c, 16.10c, central; 13.80c, 17.30c, 18.05c, western; spot up 0.25c.

CMSZ Alloys 4 & 5: (Alloy 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3.00-4.50%; alloy 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%). Prices per lb of alloy, contract or spot, bulk, carlots 14.50c; packed, carlots 15.25c, ton lots 16.00c, smaller lots 16.75c, eastern, freight allowed; 14.80c, 15.55c, 17.10c, 17.85c, central; 14.80c, 15.55c, 19.05c, 19.80c, western.

Zirconium alloy: 12-15%, per lb of alloy, eastern, contract, bulk, car lots 5.50c, packed, carlots 6.05c, ton lots 6.40c, smaller lots 6.75c, spot up 0.25c.

Zirconium alloy: Zr 35-40%, eastern, contract, packed, carlots 17.00c, ton lots 17.75c, smaller lots 19.00c; spot up 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb 6.25c; ton lots 6.75c; smaller lots 7.25c. Spot up ½c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Tungsten Metal Powder: Spot, not less than 98.8%, $2.90, freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1, 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% Na_2O; or air dried, 83-85% V_2O_5 and 5.15% Na_2O, $1.10 per lb contained V_2O_5 fob plant freight allowed on quantities of 25 lb and over to St. Louis.

Nonferrous Metal Price Tone Softens

Foreign copper eases to 23.12½c, Valley . . . Lead and zinc prices may decline later this year

NEW YORK—A softer price tone developed in nonferrous metal markets last week. Trend of electrolytic copper prices is downward with the average cost to American consumers drawing closer to the domestic price of 21.50c, Connecticut valley. Foreign copper was purchased by domestic consumers last week at 23.12½c, decline of ⅞-cent. Prediction that lead may decline before the end of the year was made by an official of St. Joseph Lead Co. last week. An unconfirmed sale of zinc was reported for shipment to Europe at a price of 10.00c a pound, Gulf ports. This is the lowest price so far mentioned since the international level of zinc began to drift lower some weeks ago and compares with a price range of 10.25c to 10.62½c on other business transacted recently.

The House Rules Committee has cleared the way for action on a bill to subsidize domestic production of copper, lead, zinc and other minerals. The bill also provides minimum prices for these metals. A Minerals Resources Division would be established in the Department of Interior and would administer the subsidy program. Director of this division would be authorized to make payments to stimulate development and exploration necessary to increase production of domestic minerals. The director would be authorized also to make up the difference between the going market price and 28 cents a pound for copper, 18 cents for lead and 18 cents for zinc.

The bill authorizes expenditures of $80 million for the minerals subsidies. It authorizes the Reconstruction Finance Corp. to buy minerals for the national defense stockpiles.

COPPER—Sale of copper at 23.12½c a pound, delivered Connecticut valley, represented the first break in the price of foreign produced copper for American consumption since suspension in April of the 4 cents a pound import tariff. Meanwhile, substantial tonnages were sold by mine producers at 21.50c. In the export market, sales were made at 22.87½c to 23.00c, fas New York.

All of the principal brass mills, with the exception of Chase Brass & Copper Co., are quoting their products on the basis of 23.00c, Valley. A split market also prevails with respect to copper wire prices in which Anaconda Wire & Cable Co. is the only factor quoting on the 23-cent basis, others holding at the 21.50-cent base.

A difference of opinion concerning the supply of copper exists among leaders of the industry, according to statements made last week at the meeting here of the National Association of Purchasing Agents. Louis S. Cates, president, Phelps Dodge Corp., said the domestic copper industry will be able to fill all normal peacetime requirements for copper if given the assurance of a reasonable price through adequate tariff protection. C. Donald Dallas, chairman, Revere Copper & Brass Inc., said that we must look to the mines of the world for the rising copper needs of our economy plus an urgently needed defense stockpile.

Mr. Cates denied current demands for copper could be regarded as permanent. He said that, based on prewar consumption, our normal requirements for newly mined copper would be 850,000 tons a year which, "in my firm belief, is within our capacity to produce at home. At present, our mines are turning out copper slightly in excess of that annual rate."

Mr. Dallas said: "The experts tell us that all known copper reserves will be out of the mines and in the mills of fabricators in 20 years or less. Elmer W. Pehrson, chief economic and statistics branch, Bureau of Mines, has estimated that American production can hold at a million tons a year for 10 years and from that point there will be a steady decline to exhaustion. And I, as a fabricator, will estimate that America can use a million and a half tons a year for the next ten years—and, gentlemen, you don't need a slide rule to figure that answer.

"It is startling—even shocking—to realize that in the United States today there is no stockpile of copper, a material as essential to the national defense as iron . . . and we haven't got it."

LEAD—The supply of lead may equal demand by summer, Irwin H. Cornell, vice president and sales manager, St. Joseph Lead Co., told the purchasing agents. He predicted present price level would continue through the third quarter but said "it was quite possible the lead price will go down before the end of the year." He estimated that in 1947 the supply of lead will be about 200,000 tons larger than in 1946 when about 900,000 tons were consumed in this country. Production for the first half of 1947 may reach 600,000 tons, he said, and it may rise still further under the impetus of the present 15-cent price.

Expressing fears that lead is "overpriced" at 15 cents, Mr. Cornell said: "My fear of the 15-cent lead price is that substitutes will be found for lead and some of its most important outlets will be lost for good."

ZINC — With respect to zinc, Mr. Cornell predicted that "if the premium price plan is continued after June 30, the price of zinc might recede this summer."

TIN — Representatives of the Reconstruction Finance Corp. asked the Senate last week to extend the government's authority to operate the Texas City, Tex., tin smelter. They warned that tin may well be a scarce commodity through 1948. A bill which would extend the June 30, 1949, RFC's authority to operate the smelter also provides that Congress make a thorough study and investigation of the advisability of maintaining a domestic tin smelting industry on a permanent basis.

SILVER — Handy & Harman's "official" price held last week at 70.75c per ounce in a quiet market.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c-23.12½c, del. Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 19.50c; 88-10-2 (No. 215) 27.25c; 80-10-10 (No. 305) 23.50c; No. 1 yellow (No. 405) 15.75c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.50c; No. 12 foundry alloy (No. 2 grade) 14.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 13.00c; grade 3 (90-92%) 12.25c; grade 4 (85-90%) 11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $84-$87 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.50 lb for 550 lb (keg); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 70.75c per ounce.

Platinum: $58-$61 per ounce.

Palladium: $24 per troy ounce.

Iridium: $85-95 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 23.00c, Connecticut, for electrolytic copper. Freight prepaid on 100 lb or more. One major producer quoting on basis of 21.50c for electrolytic.)

Sheet: Copper 35.18c; yellow brass 30 63c; commercial bronze, 95% 35.15c, 90% 34.46c; red brass, 85% 33.27c, 80% 32.58c; best quality brass 31.72c; Everdur, Duronze, Herculoy or equiv., cold drawn, 39.88c; nickel silver, 18% 43.21c; phosphor bronze, grade A, 5% 53.42c.

Rods: Copper, cold-drawn, 32.53c; yellow brass, free cutting 25.32c, not free cutting 30.32c; commercial bronze, 95% 34.84c, 90% 34.15c; red brass, 85% 32.96c, 80% 32.27c; best quality brass 31.41c.

Seamless Tubing: Copper 35.22c; yellow brass 33.39c; commercial bronze, 90% 36.87c; red brass, 85% 35.93c, 80% 35.24c; best quality brass 34.13c.

Wire: Yellow brass 30.92c; commercial bronze, 95% 35.44c, 90% 34.75c; red brass, 85% 33.56c, 80% 32.87c; best quality brass 32.01c.

Copper Wire: Bare, soft, fob eastern mills, carlots 29.22c, less carlots 29.72c; weatherproof, fob eastern mills, carlots 29.39c, less carlots 29.89c; magnet, delivered, carlots 32.63c, 15,000 lb or more 32.88c, less carlots 33.38c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq. ft; 75c, 10 to 20 sq ft and circles.
Pipe: Full coils 17.50c; cut coils 17.75c.
Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 29.84c; oval, 29.34c; electro-deposited, 29.09c; cast, 28.84c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 94.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb. 95.75c; less than 200 lb, 96.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., 60.00c; 100 lb kegs, 60.50c.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.00c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb. 45.50c; 1000 to 1999, 46.50c; 600 to 9999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A. B.	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass 14.50, auto radiators 11.00, heavy yellow brass 10.00, brass pipe 10.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.37½; No. 2 copper, 16.87½, light copper, 15.37½; refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 14.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire, No. 1 16.00-16.50, No. 2 15.00-15.50, light copper 14.25-14.75; No. 1 composition red brass 12.50-13.00, No. 1 composition turnings 11.50-12.00, mixed brass turnings 7.50-8.00, new brass clippings 12.00-12.50, No. 1 brass rod turnings 10.50-11.00, light brass 6.50-7.00, heavy yellow brass 8.00-8.50, new brass rod ends 11.00-11.50, auto radiators, unsweated 9.50-10.00, cocks and faucets 9.50-10.00, brass pipe 9.00-9.50.

Lead: Heavy lead 11.50-12.00, battery plates 6.75-7.25, linotype and stereotype 12.75-13.25, electrotype 10.75-12.25, mixed babbitt 13.50-14.00, solder joints 15.50.

Zinc: Old zinc 5.00-5.50, new die cast scrap 4.00-4.50, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S, 8.50-9.00, old sheets 6.50-7.50, crankcase 6.25-6.75, borings and turnings 2.25-3.50, pistons, free of struts, 6.00-6.50.

Nickel: Anodes 19.50, turnings 16.50-17.50, rod ends 19.00-20.00.

Monel: Clippings 14.00-15.00, turnings 9.00-10.00, old sheet 11.00-12.00, rods 12.50-13.00, castings 10.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

(Prices for open hearth grades from remote points range up to $32.50, depending on the freight charges.)

No. 1 Heavy Melt. Steel	$30.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	30.00
Nos. 1, 2 & 3 Bundles.	30.00
Machine Shop Turnings.	26.50-27.00
Mixed Borings, Turnings	26.50-27.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	28.00-28.50
Bar Crops and Plate	37.00-37.50
Low Phos. Cast Steel	37.50-38.00
Punchings & Plate Scrap	37.50-38.00
Cut Structurals	37.50-38.00
Elec. Furnace Bundles.	37.50-38.00
Heavy Turnings	31.00-31.50
Alloy Free Turnings	29.50-30.00
No. 1 Chemical Borings	31.00-32.00

Cast Iron Grades

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast.	33.00-34.00
Stove Plate	37.50-38.00
Unstripped Motor Blocks	37.50-38.00
Malleable	44.50-45.00
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	42.00-42.50
Burnt Cast	35.00-36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	34.50-35.00
R.R. Malleable	44.50-45.00
Axles	40.00-41.00
Rails, Rerolling	37.00-37.50
Rails, Random Lengths	35.00-36.00
Rails, 3 ft and under	39.00-39.50
Rails, 18 in. and under.	41.00-41.50
Railroad Specialties	41.00-42.00
Uncut Tires	38.00-39.00
Angles, Splice Bars	38.00-38.50

CLEVELAND

No. 1 Heavy Melt. Steel	$30.50-31.00
No. 2 Heavy Melt. Steel	30.50-31.00
No. 1 Busheling	30.50-31.00
Nos. 1 & 2 Bundles	30.50-31.00
Machine Shop Turnings.	25.50-26.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	27.00-28.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	33.50-34.50
Cast Steel	33.50-34.50
Punchings & Plate Scrap	33.50-34.50
Elec. Furnace Bundles.	31.50-32.00
Heavy Turnings	30.00-30.50
Alloy Free Turnings	29.50-30.00
Cut Structurals	37.50-38.00

Cast Iron Grades

No. 1 Cupola	43.00-45.00
Charging Box Cast	38.00
Stove Plate	38.00
Heavy Breakable Cast.	38.00
Unstripped Motor Blocks	40.00
Malleable	52.00-55.00
Brake Shoes	42.00
Clean Auto Cast	45.00
No. 1 Wheels	42.00
Burnt Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-35.00
R.R. Malleable	52.00-55.00
Rails, Rerolling	40.00-41.00
Rails, Random Lengths	38.00-39.00
Rails, 3 ft and under	44.00
Railroad Specialties	42.00
Uncut Tires	41.00
Angles, Splice Bars	44.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	31.00-31.50
No. 1 Bundles	31.00-31.50
Machine Shop Turnings.	26.00-27.00
Short Shovel Turnings.	28.00-29.50
Cast Iron Borings	28.50-29.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	34.00-35.00

MANSFIELD

No. 1 Heavy Melt. Steel	$31.00-31.50
Machine Shop Turnings.	26.00
Short Shovel Turnings.	28.00

CINCINNATI

No. 1 Heavy Melt. Steel	$28.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Busheling	27.00
No. 1 Bundles	27.00
No. 2 Bundles	27.00
Machine Shop Turnings.	22.00
Mixed Borings, Turnings	21.00
Short Shovel Turnings.	24.00
Cast Iron Borings	23.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	31.00
Heavy Breakable Cast.	34.00
Stove Plate	29.00
Unstripped Motor Blocks	32.00
Brake Shoes	28.00
Clean Auto Cast	38.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00
R.R. Malleable	44.00
Rails, Rerolling	35.00
Rails, Random Lengths	35.00
Rails, 18 in. and under.	42.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$26.00-26.50
No. 1 Busheling	26.00-26.50
Nos. 1 & 2 Bundles	26.00-26.50
No. 3 Bundles	26.00-26.50
Machine Shop Turnings.	21.50-22.00
Mixed Borings, Turnings	21.50-22.00
Short Shovel Turnings.	22.50-23.00
Cast Iron Borings	22.50-23.00
Punchings & Plate Scrap	31.00-31.50

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast.	25.00-27.00
Clean Auto Cast	33.00-34.00

BUFFALO

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	31.00-32.00
No. 1 Busheling	31.00-32.00
Nos. 1 & 2 Bundles	31.00-32.00
Machine Shop Turnings.	23.00-23.50
Mixed Borings, Turnings	23.00-23.50
Cast Iron Borings	23.00-23.50
Short Shovel Turnings.	25.00-25.50
Punchings & Plate Scrap	35.00-36.00
Elec. Furnace Bundles.	37.00-38.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-38.00
Charging Box Cast	29.00-30.00
Heavy Breakable Cast.	30.00-31.00
Stove Plate	33.00-35.00
Malleable	40.00-41.00
Clean Auto Cast	35.00-37.00
No. 1 Wheels	38.00-39.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
No. 1 Bundles	31.00-32.00
No. 2 Bundles	27.00-28.00
No. 3 Bundles	25.00-26.00
Machine Shop Turnings.	23.00-24.00
Mixed Borings, Turnings	21.00-22.00
Short Shovel Turnings.	24.00-25.00
Bar Crops and Plate	34.50-35.50
Punchings & Plate Scrap	34.50-35.50
Cut Structurals	34.50-35.50
Elec. Furnace Bundles.	32.50-33.50
Heavy Turnings	31.00-32.00
No. 1 Chemical Borings	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-43.00
Charging Box Cast	41.00-42.00
Heavy Breakable Cast.	40.00-41.00
Unstripped Motor Blocks	38.00-38.50
Malleable	50.00-52.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	43.00-44.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$25.00-26.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Busheling	24.00-25.00
Nos. 1 & 2 Bundles	25.00-26.00
No. 3 Bundles	23.00-24.00
Machine Shop Turnings.	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings.	20.00-21.00
Punchings & Plate Scrap	28.00-29.00
Cut Structurals	28.00-29.00
Elec. Furnace Bundles.	28.00
No. 1 Chemical Borings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Charging Box Cast	36.00
Heavy Breakable	33.00-34.00
Unstripped Motor Blocks	33.00-34.00
Malleable	46.00-48.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$24.25
No. 2 Heavy Melt. Steel	24.25
Nos. 1 & 2 Bundles	24.25
No. 1 Busheling	22.25-24.25
Machine Shop Turnings.	19.00-20.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings.	21.00-22.00
Bar Crops and Plate	27.00
Punchings & Plate Scrap	27.00
Chemical Borings	21.00-22.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Charging Box Cast	38.00
Heavy Breakable Cast.	33.00
Stove Plate	37.00
Unstripped Motor Blocks	30.00
Clean Auto Cast	40.00

CHICAGO

No. 1 Heavy Melt. Steel	$28.50-29.00
No. 2 Heavy Melt. Steel	28.50-29.00
Nos. 1 & 2 Bundles	28.50-29.00
No. 3 Bundles	26.50-27.00
Machine Shop Turnings.	23.00-24.00
Mixed Borings, Turnings	23.00-24.00
Short Shovel Turnings.	25.00-26.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	31.00-31.50
Cast Steel	31.00-31.50
Punchings	31.00-31.50
Elec. Furnace Bundles.	29.50-30.00
Heavy Turnings	28.00-28.50
Cut Structurals	30.50-31.00

Cast Iron Grades

No. 1 Cupola Cast	37.00-43.00
Malleable	40.00-45.00
Clean Auto Cast	40.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	29.50-30.00
Rails, Rerolling	33.50-34.50
Rails, Random Lengths	32.50-33.50
Rails, 3 ft. and under	36.50-37.50
Rails, 18 in. and under	37.50-38.50
Railroad Specialties	34.50-35.50
Angles, Splice Bars	34.50-35.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$29.00-30.00
No. 2 Heavy Melt. Steel	26.50-27.50
Machine Shop Turnings	21.00-22.00
Short Shovel Turnings.	22.00-23.00

Cast Iron Grades (Fob shipping ponit)

No. 1 Cupola Cast	37.50-38.50
Charging Box Cast	30.00-31.00
Heavy Breakable Cast.	29.00-30.00
Stove Plate	29.00-32.00
Brake Shoes	32.00-35.00
Clean Auto Cast	37.50-38.50
No. 1 Wheels	38.00-40.00
Burnt Cast	29.00-32.00

Railroad Scrap

R.R. Malleable	45.00-47.00
Rails, Rerolling	30.00-33.00
Rails, Random Lengths	30.00-33.00
Rails, 3 ft and under	37.00-39.00
Uncut Tires	32.00-34.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$27.00
No. 2 Heavy Melt. Steel	27.00
No. 1 Busheling	27.00
Nos. 1 & 2 Bundles	27.00
No. 3 Bundles	25.00
Long Turnings	22.00
Short Shovel Turnings.	24.00
Cast Iron Borings	23.00
Bar Crops and Plate	32.00-33.00
Punchings & Plate Scrap	36.00-37.00
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Stove Plate	34.00-35.00
No. 1 Wheels	32.00-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R.R. Malleable	37.50-38.00
Axles, Steel	33.00
Rails, Rerolling	36.00-37.00
Rails, Random Length.	30.00-31.00
Rails, 3 ft and under.	32.00-33.00
Angles and Splice Bars.	32.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$19.04
No. 2 Heavy Melt. Steel	*19.04
No. 1 Busheling	*19.04
Nos. 1 & 2 Bundles	*19.04
No. 3 Bundles	*17.04
Machine Shop Turnings.	*12.54
Bar Crops and Plate	18.00
Cast Steel	18.00
Alloy Free Turnings	8.00
Cut Structurals	20.00-20.50
Tin Can Bundles	17.00

Railroad Scrap

Axles	26.50
Rails, Random Lengths.	21.00
Uncut Tires	28.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Busheling	20.00
Nos. 1 & 2 Bundles	20.00
No. 3 Bundles	18.00
Machine Shop Turnings.	11.50
Mixed Borings, Turnings	11.50
Punchings & Plate Scrap	21.50
Cut Structurals	21.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars.	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
Nos. 1 & 2 Bundles	19.50
Machine Shop Turnings.	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	27.50
Elec. Furnace Bundles.	27.00

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Sheets, Strip. . .

Flat rolled steel demand remains heavy despite drop in consumer goods buying

Sheet Prices, Page 132

Boston—On only a few finished fabricated steel products is a slight letdown in demand reflected at mill levels by the filling of supply lines to consumer outlets. Indeed, pressure for steel continues for some goods already clogging retail shelves. Dealers are crying "uncle" on clock shipments, razors, an increasing number of household appliances, galvanized pails and miscellaneous gadgets. And, while there are scattered cancellations, deferments and a slackening in new buying, demand for steel is not fully mirroring what is taking place at the retail end, caused by consumer price resistance. Razor output has been cut back and blade production has caught up with demand after filling supply pipe lines. Demand for flat-rolled continues in excess of allotments, notably in narrow cold-rolled strip, although the same holds for galvanized, electrical and light gage black sheets. Some deferments by automobile parts fabricators reflects unbalance in inventories, parts banks having accumulated against a shortage of sheet steel at Detroit. Tending to cramp narrow cold-strip schedules is lack of balance in grades and sizes of hot strip. Cold mills are unable to get delivery on specific items before fourth quarter and are forced to maintain production schedules with the grade and size of material available.

New York — While sheet demand probably will continue well in excess of supply throughout the remainder of this year, there are some consumer lines which are at least beginning to get caught up with demand. This is true with washing machines and refrigerators, although certain leading manufacturers are still far behind on their commitments. Electric irons, bathroom heaters, metal venetian blinds and fluorescent light reflectors are some of the items on which substantial progress has been made. Easing pressure for sheets and strip for some items can be ascribed, however, more to shortages in other manufacturing components rather than to saturation in consumer demand.

Philadelphia — Sheet producers are saddled with more inquiry than they can handle, although there is an easing in demand in some directions, due in part to seasonal influences and to inability of consumers to obtain a balanced inventory of materials and components required in manufacturing their end products. This latter situation, in fact, even applies to stainless, demand for which has been off quite considerably recently. Moreover, there also appears to be some catching up with consumer requirements in certain of the more minor consumer goods lines. In stoves, some of the larger manufacturers have been slow in issuing specifications, because of the increasingly slow movement of their plainer models which were turned out in the interest of materials conservation and of lower cost to the consumer. However, more attractive models are beginning to appear again and various stove makers are holding up on specifications for cold-rolled sheets and enameling stock while they take a new survey of the market. On the other hand, casket makers, who are restricted in their use of long ternes, are pleading for all the cold-finished sheets the mills can supply.

Chicago — Sheet and strip makers report no easing in demand and almost no cancellation of tonnage or hold back instructions on shipments. In several instances, specifications are being received at a rate which is substantially in excess of shipments. While opinion prevails that there will be no coal strike after July 1, the possibility that one could occur produces uneasiness among producers of sheet and strip as well as consumers of these products. Such a setback would only delay longer into 1948 the date when supply and demand for flat-rolled products are expected to come into reasonable balance.

Cincinnati — Although third quarter schedules have been completed and allocations reported, sheet consumers continue to press for larger tonnages. A few exceptions do not alter the general situation—a clamor for sheets beyond capacity to produce. The Newport, Ky., steelworks of the Detrola Corp. expects soon to have adequate pig iron supply from a recently acquired furnace in Wheeling, W. Va., which was lighted this week.

Birmingham—Sheet users continue to operate on a hand-to-mouth basis in this territory and, as a result, their operations are considerably less than capacity. Some strip tonnage is being produced, the most of it consisting of cotton ties for the new season just ahead.

St. Louis—Sheet production began to climb upward from the recent 40 per cent of capacity level following settlement of a strike at Granite City Steel Co. Full scale operation is expected in two to five weeks. Under pressure of unremitting demand, virtually all finished and semifinished sheets were shipped in May, creating a production gap which will require some time to fill. Granite City is opening its books for hot-rolled sheets for the first time in nearly a year. Cold-rolled sheet orders are to be accepted around the end of the year. Due to long closing of the books, order backlogs are not excessively heavy. Local mills regard the sheet shortage in this district as perhaps the worst in the nation. Consumer inventories are practically nonexistent and some eastern mills which formerly helped serve this territory have withdrawn from the market since Jan. 1. A recent development concerns eastern consumers seeking to contract for steel from this district on 5 to 10-year basis, the buyer absorbing the freight.

Rails, Cars . . .

Track Material Prices, Page 133

New York—Domestic freight car buying has undergone a spurt, with the New York Central having closed on 2000 fifty-ton box cars and the Duluth, Mesabi & Iron Range on 2000 seventy-ton hopper cars. Louisville & Nashville has closed on 3000 hopper cars, dividing the business equally between two car builders. New Jersey, Indiana & Illinois, a Wabash subsidiary, has closed on 100 fifty-ton auto cars. At least a portion of this equipment was placed in the closing days of last month which might bring the May total to within fair range of the average for the preceding months of the year, if not comparable with it.

Steel Bars. . .

Consumers' inventories improve, except in small carbon rounds and flats

Bar Prices, Page 132

Boston—For third quarter, most ba consumers will be better supplied and i some plants enough tonnage is in pros pect to balance requirements. There ar exceptions in small carbon rounds, no tably hot-rolled, and high carbon flats but on the whole outlook is improved Forge shops' inventories vary consider ably, from top-heavy to low, and th same applies to holdings of finishe forged products among distributors. Fo the most part, the scramble for forge tools and hardware has subsided. Sup pliers of cold finished are generally mor liberal with allotments and some ar not allocating except in the smalle sizes. Part of the mild slackening i demand for bars is due to unbalance i inventories; screw machine parts hav piled up ahead of flat-rolled, casting and other components. In any event indications are balance in supply i being reached in bars before other majo carbon steel products.

New York — The trend in hot carbon bars appears to be mixed, with some producers reporting a tightening in demand and others an easing. Some progress apparently is being made toward balancing supply and demand, but this balance still will not be reached for some time and in the case of the small sizes possibly not until late this year, if then. The trend in cold-drawn carbon bars is more definitely downward, and in the case of hot and cold alloy bars, supply and demand have long since come in balance.

Philadelphia — While easing somewhat over recent months, especially in the larger sizes, demand for hot-rolled carbon bars now is holding fairly steady, with requirements for the smaller and medium sizes still well in excess of supply. New bar producing facilities at Lackawanna are not expected to provide much relief for a while. In the first place, it is pointed out, they represent replacements to a certain extent and, further, the raw material supply was adversely affected there by the recent blowing out of a furnace which may be down two months for complete relining.

Reinforcing Bars. . .

Reinforcing Bar Prices, Page 132

Chicago — New inquiry for reinforcing steel is not as strong as in recent weeks, particularly for projects requiring the larger tonnages. This appears to be the result of the postponement or abandonment of much new construction work until such time as steel is more readily available and building costs are lower. Small requirements are in good volume and supply interests show preference for these because they can be accommodated with more facility in mill receipts of reinforcing material. Pressure is growing for firm prices but it is not customary practice, although it undoubtedly is being done in some instances.

Philadelphia — Scarcity of steel and the high cost of building construction continue to restrict activity in the rein-

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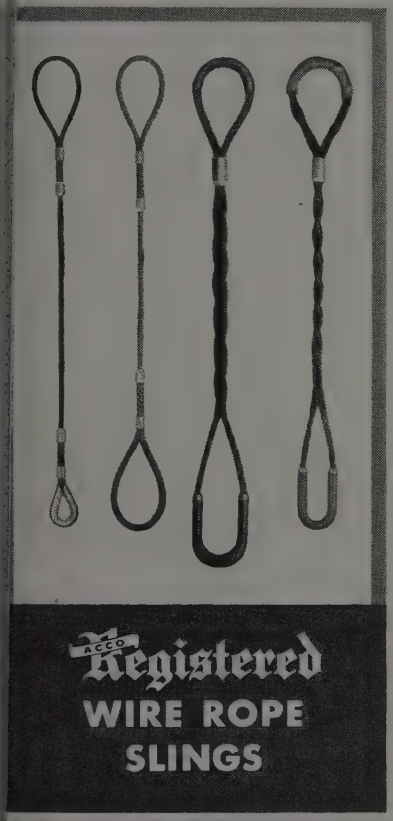

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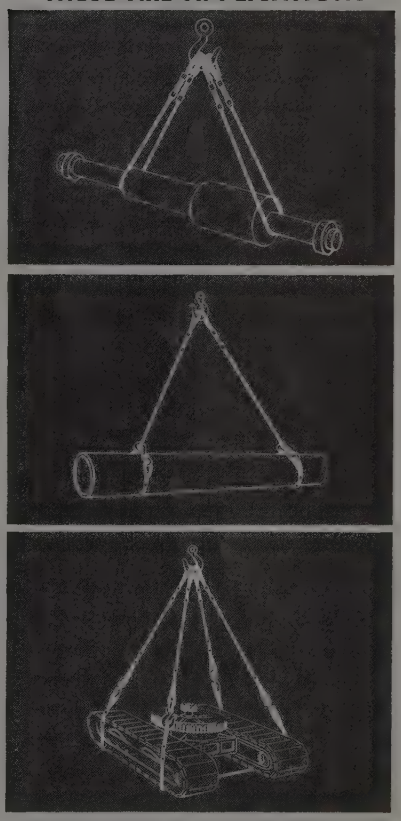

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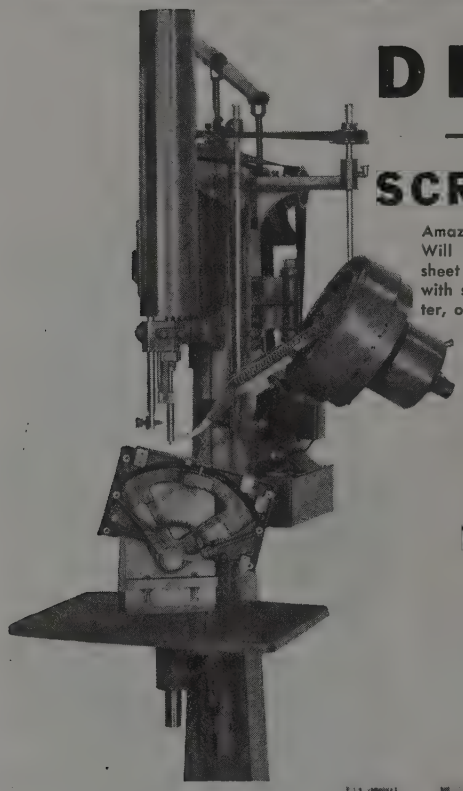

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ALL SCREWS DRIVEN TO UNIFORM TENSION

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NO MARRING OF HEADS

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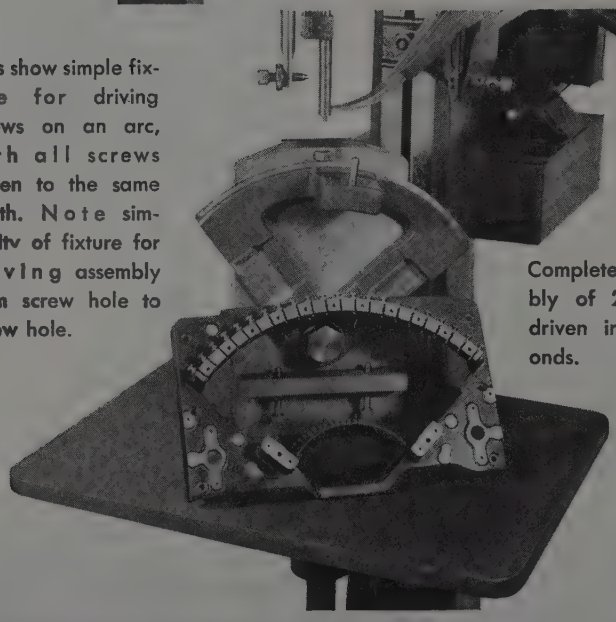
Cuts show simple fixture for driving screws on an arc, with all screws driven to the same depth. Note simplicity of fixture for moving assembly from screw hole to screw hole.



Complete assembly of 22 screws driven in 45 seconds.

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forcing bar market. Outstanding inquiri involve 250 tons for a Sears Roebuc & Co. store at Erie, Pa., and 180 to for a New Jersey state bridge in Glo cester county. The latter project al requires 725 tons of structural shapes.

Seattle — Rolling mill capacity is full operation here. A large volume small tonnages is being booked. It co tinues to be a sellers' market, mills b ing in position to select new busine and to give regular customers preferenc Order backlogs are still sizable. Ma large projects have either been postpone or awards are pending. There is suff cient tonnage booked or is immediate available to insure full production t the end of 1947.

Steel Plate. . .

Plate Prices, Page 133

Chicago — No easing in plate deman is discernible now, the opinion being tha requirements will exceed productio throughout the balance of this year. Vi tually every plate user, notable amon these being tank and boiler maker heavy machinery manufacturers and pip fabricators, is pressing for faster ship ments and increased quotas. Mills ar understood to be meeting their obliga tions in shipments of plates for the accel erated freight car building program, bu car production statistics show clearl that the material is not being used at corresponding rate. Platemakers ar watching the situation and if it develop that car builders are unable to get unde way more rapidly, it is conceivable tha some cutbacks in shipments may be i order.

New York — Plate supply continue tight, although pressure for tonnage i lighter than earlier in the year, due prob ably in part to the fact that consumers realize the futility of trying to get early deliveries. Producers generally ar booked up solidly during the third quar ter, with others, who are not selling on a quarterly basis, booked up well be yond that. Some have orders running into next year, but in general there is no acceptance of business beyond 1947.

Boston—Plate fabricators now look to the fourth rather than third quarter for any substantial improvement in ton nage; even then heavy requirements for large diameter pipe and railroad freight cars will earmark a large volume through the balance of this year. Warehouses are especially short of plates in lighter gages and allotted tonnage has in some cases been reduced; limited volume reaching distributors moves out prompt ly. Tank fabricators are managing to fabricate more tanks than before despite a shortage of plates. The trend toward oil for domestic heating in New England is building up toward peak tank require ments once building costs become ad justed. This means eventually increased storage facilities and possibly pipe lines.

Philadelphia — Demand for plates continues strong with mills turning down large tonnages daily, either because they are sold out for the third quarter and refuse to accept any business for ship ment beyond that period, or because they are just not interested for any one of several reasons. Most mills are behind on current commitments, with substantial carryovers likely at the end of this quar ter. Export situation is in a snarl, plate producers pointing out that Washington has not as yet issued licenses for third

arter shipment, which is now less than ee weeks off.

Birmingham—Plate tonnage continues avy and production remains as near pacity as the steel ingot situation will rmit. Mills have large order backlogs, hough they are not as great as preusly, due largely to the fact that bookgs are held down to about five months ward. Tank manufacturers and shipilding continue to account for the jor portion of the tonnage.

Seattle — In view of the plate shortge, plants are confining new business orders involving only those items that e available, substituting in some inances. Many small jobs are being offed to fabricators who are hesitating to d on major projects.

ubular Goods...

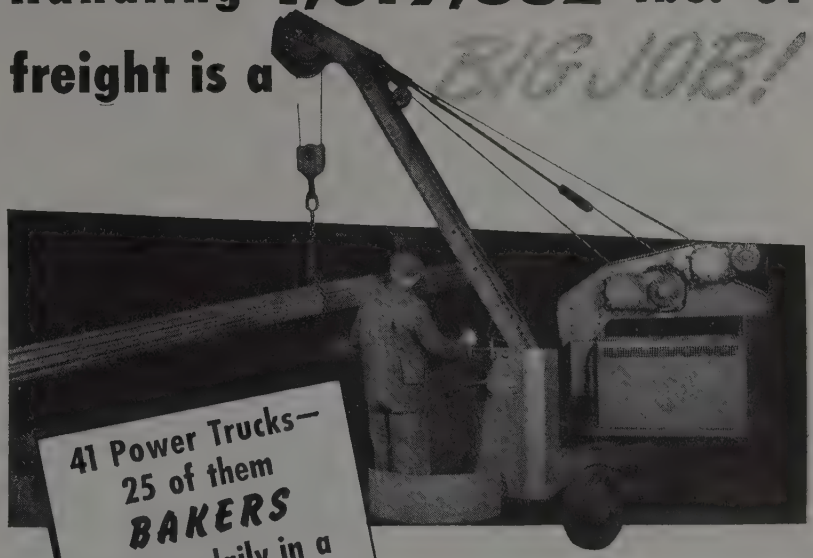
Tubular Goods Prices, Page 133

Pittsburgh — Jobbers expect little imovement in inventories of standard pe items through remainder of this ar. Demand is far in excess of supy and shows no significant sign of easg. Shortage of carbon tube rounds ntinues to retard tubing production hedules. However, more conservative dering recently by some consumers s permitted producers of seamless and ectric welded carbon steel tubing make some headway against extended der backlogs. Demand for stainless and loy tubing has eased slightly. Cast n pipe output remains relatively high, though inadequate pig iron supply conues a retarding factor. No significant sing in supply of line pipe and oil untry goods is indicated through 1948. Denying reports that exorbitant tonge of pipe is exported, producers state ss than 7 per cent of output is shipped broad. Pipe production schedules are elow industry's rated capacity, but outt never reached theoretical capacity ven during the war. Integrated proucers point out that pent-up demand r other steel products makes it imssible to increase pipe output without eriously restricting production of other adly needed steel products. It is also ated that margin of profit on pipe prouction is below average for other steel roducts due in part to the greater numer of man hours for its production.

Boston — All types of semifinished eel, including skelp, coil strip, billets nd plates, which enter into production f pipe are in limited supply. Pipe prouction, now at an annual rate of about .75 million tons, is not likely to inrease until demand eases for semifinhed steel for producing other prodcts. Among the tightest of tubular roducts, standard steel pipe is held to bout 40 per cent of total output and his cannot be increased. The pipeline n pipe is no where near filled, although obbers, distributing the bulk of this rade, are getting allocations in excess f prewar shipments in most cases. Conmer demand has dropped slightly, prinarily for building, but if buying should alt entirely at least three months would e required to build up normal invenories.

Seattle — Demand for cast iron pipe s tempered by the inability of quick elivery, present contracts reading 18 to 4 months forward. The potential marlet is of large proportions in this area, owever, and will develop as soon as nills can reduce order backlogs.

Handling 1,619,882 lbs. of freight is a BIG JOB!



Baker Crane Truck unloading bar stock from gondola car. Truck transfers stock directly to highway truck for local delivery.

During a recent normal 3 mos. period, this freight station averaged 1,619,882 lbs. of miscellaneous material handled per 9½ hour day. Handling operations consist of unloading, storing in warehouse, or reloading into highway trucks or freight cars for shipment elsewhere.

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This Baker Platform Truck is taking a load of freight into boxcar for shipment to another station.

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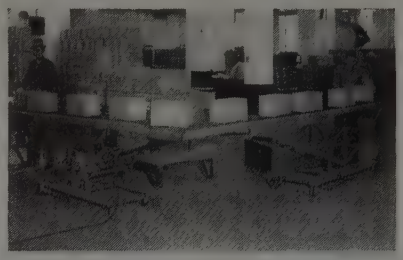
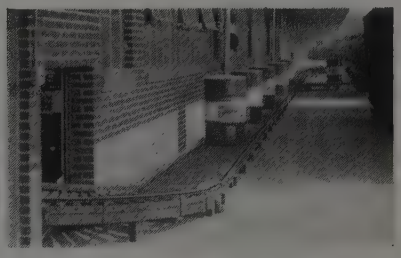
Slat type conveyor used to speed assembly and crating of refrigerators.



STORAGE AREAS
Portable "Handibilt" conveyors used as a continuous conveyor line in storage area.



LOADING PLATFORM
Oil drums leave the warehouse for loading into boxcars on gravity roller system.

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Wire. . .

Wire Prices, Page 133

Pittsburgh — Supply outlook for merchant and manufacturers wire products is expected to remain tight through remainder of this year. Jobbers have been unable to augment depleted stocks of most merchant wire items to meet extreme heavy demand, while requirements for manufacturers wire remain well above present output. An occasional opening in production schedules develops from hold-up of delivery due to unbalanced inventory positions of some customers, but these openings are readily filled and in general there is no easing in pressure for deliveries. The unbalanced supply-demand situation in wire rods is particularly acute, with some nonintegrated interests in the East operating well below capacity.

Allegheny County Purchasing Agent M. M. Donohue told county commissioners last week all construction on buildings and stands for the county fair has been halted indefinitely because the inability to legally pay double the contract price demanded by dealers for spikes and heavy nails. Dealers who have contracts for furnishing the county heavy nails at $5 per 100 keg are unable to deliver. Other dealers, however, can furnish all of nails needed at $10 per keg, Mr. Donohue said.

Boston — Some wire mills are currently making slight inroads against high carbon specialty order backlogs, but some of this ground will be lost late this quarter when vacations will reduce output. Pressure for music wire is generally easier and spring makers are specifying with an eye to inventories. Pressure has also eased for bedding and upholstery wire, although demand from the automotive trade is better maintained. Overall new orders are smaller, but backlogs on numerous products extend well into fourth quarter and considerable tonnage is yet to be scheduled. Automobile engine builders continue to pound for valve spring wire. While wire products are still the most extended, there is evidence of easing on an increased number. Some users report a slight improvement in supply of rods, but the gain in tonnage is nothing for nonintegrated mills to be enthused about. The largest producer in this area requires several thousand tons monthly from affiliated mills to maintain schedules.

Chicago — Wiremakers report some slight easing in demand for cold-finished bars, fine wire and some sizes of oil-tempered wire, but this does not aggregate sufficient volume to ease pressure for deliveries or increases in quotas. Requirements are heavy for bale ties, steel posts and barbed wire. Overall demand for all wire and wire products exceeds abilities of mills to produce.

New York — Not much chance for an improvement in supply of many wire products to balance demand exists in third quarter, but for the fourth this development is more generally foreseen on an increased number of items, although the supply of rods will be the ultimate answer. Meanwhile, most consumers are accepting third quarter drawn wire allocations offered and some would take more if available. New ordering is more conservative, however, notably for wire entering into consumer goods, supply of some now filling pipe lines at

tail levels. Demand for heading wire nd screw stock is active, but less fever- h. Jobber quotas on nails to some astern distributors have been reduced. azor blade volume has petered out; me eastern mills for the time are not aking it. Rope is slow. Limited ton- age of Swedish rods is coming in, bulk eing drawn into piano wire by one pro- ucer.

Birmingham—Wire products, especial- nails, are acutely short. Some relaxa- on was noted in the past few weeks, ut seasonal demand from agricultural terests has intensified inquiries. Allo- ations are still in effect and jobbers e able to supply only relatively small uantities of wire products. Processors e still short on drawn wire.

Structural Shapes. . .

Structural Shape Prices, Page 133

Pittsburgh — More active bidding on ending work is noted among fabricators, lthough most interests still have sub- tantial order backlogs. Structural ton- age involved in new inquiries is report- d off somewhat from the level recorded arlier this year due to fact construc- on costs are well above previous esti- nates. Most structural mills expect to lear up bulk of carryover tonnage some ime next quarter. Industrial construc- on applications approved by local of- ces of the Office of Housing Expediter or week ended May 29 include a $115,- 40 project for Crucible Steel Co. of merica. Construction also is expected o get under way this month on a $3 illion coal conversion plant for Disco o., subsidiary of Pittsburgh Consolida- ion Coal Co.

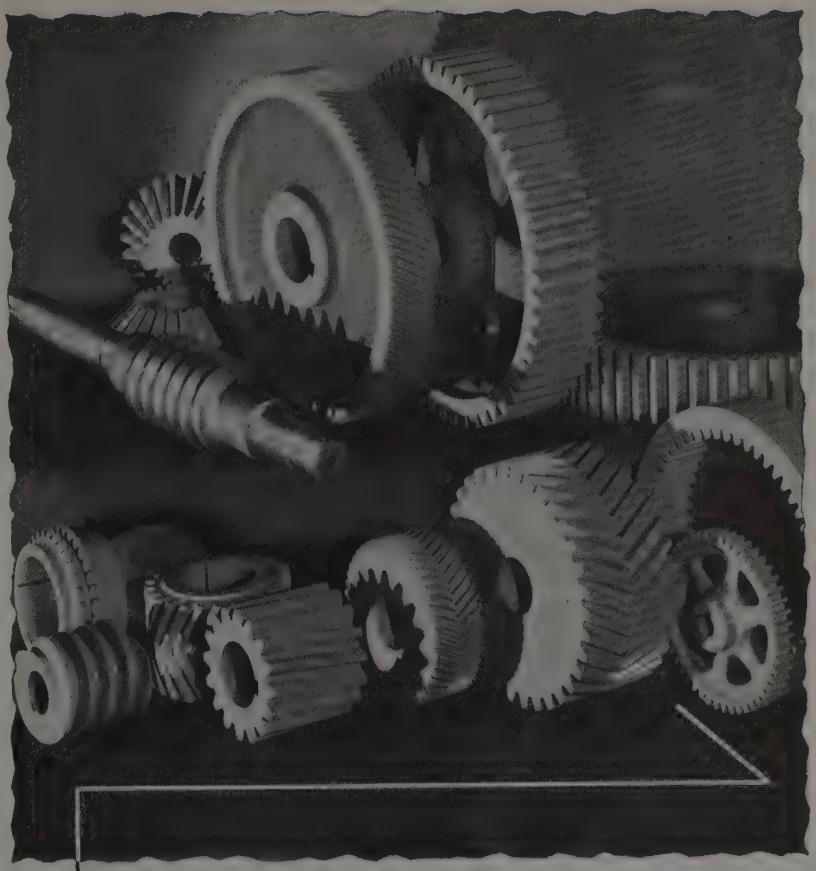
The Building Trades Employers' As- ociation granted a 25-cent per hour age advance to about 1800 AFL struc- ural iron workers in Western Pennsyl- ania last week.

New York—While several new school obs are being figured, commercial work s light, with much work generally being eferred because of high costs. At the ame time, most fabricators still have ood order backlogs, and the shape mills re still behind on their orders, al- hough catching up somewhat.

Philadelphia — Activity in the struc- ural steel market is slightly improved, ut still lagging because of high costs nd labor disturbances in the building rades. A leading inquiry involves 2735 ons for a state bridge in Luzerne coun- y, Pennsylvania, with bids due June 20.

Chicago — Fabricators report grow- ng pressure for firm quotations, and while they believe such practice would e beneficial to builders they feel the uture is too uncertain for them to adopt he practice. Most fabricators have suf- icient uncancellable tonnage on their ooks to assure high level operations well into 1948. They do not know how hey will fare on receipt of shapes from mills over the balance of the year or whether the situation may be aggravated by interrupted steel production by vir- ue of a coal strike next month. New nquiry for fabricated steel is only mod- rate but still is more than can be ac- ommodated.

Seattle — Fabricators report a steady rm of small jobs involving less than 100 tons each of structural steel. In view of the steel shortage, plants prefer minor contracts rather than commit themselves beyond possible material supply.



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Tin Plate. . .

Tin Plate Prices, Page 133

Pittsburgh—No recession in tin mill products requirements is expected until fourth quarter at earliest. Pressure for delivery remains acute for most type containers, particularly oil and beer cans. Some easing in tin plate requirements for crown closures is reported, however, with March consumption off about 10 per cent from the 1946 monthly peak. Relatively minor decline in tin plate demand for coffee containers also is noted. General line can needs continue heavy and are expected to largely offset the anticipated easing in demand for the perishable food pack program later this year. Other offsetting factors are extremely heavy demand for export and fact inventories of container companies are abnormally low. Tin plate shipments may be hampered early this fall when present box car shortage will be accentuated by the indicated heavy grain movement.

Bolts, Nuts. . .

Bolt, Nut, Rivet Prices, Page 133

New York — While some eastern bolt and nut manufacturers recently changed their discounts, others have as yet taken no action but are expected to eventually, especially in view of the continued pressure for tonnage. One eastern producer has increased some discounts and reduced others. However, the overall change amounts to an increase of about 14.5 per cent over the old OPA schedules. These increases reflect higher operating costs. Accompanying the new revisions is some simplification in the various categories of bolts and nuts. Order backlogs in the light assembly fasteners are not quite as heavy as they were, although they average four to six months. Backlogs on the heavier items range around 60 to 90 days.

Cleveland — New price schedules on bolts which producers in the area are now figuring have not been released but reports indicate they will eliminate inequalities and help offset increased labor costs of the industry without resulting in large over-all price changes. It appears probable prices of some semifinished nuts will also be revised in the new schedules.

Pig Iron. . .

Pig Iron Prices, Page 134

Boston — Evidence mounts pointing toward price as a growing factor in pig iron purchasing over the second half of the year when more tonnage will become competitive with the $45 Everett quotation. As the Mystic furnace production is not sufficient to cover all requirements, price will be a consideration, at least for the uncovered consumers, if supply improves. Higher cost probably will eliminate foreign and Texas iron. In the final analysis much depends on the volume of supply. Scrap prices and quality are also tied into the situation and most foundries will use more iron in melts, if available and if cost differentials are in line. Many users are dissatisfied with the quality of castings and a trend toward more iron in melts is also borne out by closer checks on silicon analysis.

To equalize Beacon, N. Y., with the Oswego route, applying only on shipments ex vessel at Beacon, but not to include connecting line switching charges there or Worcester, rate on pig iron to Worcester is being reduced to $1.86 per gross ton from $2.20.

Pittsburgh—Most foundries in this district continue to operate on a hand-to-mouth basis in regard to pig iron supply, and no significant improvement is indicated through remainder of year. Lone merchant producer here expects the pig iron supply shortage to become more acute. Merchant pig iron output here is less than 60 per cent of stated requirements, while shipments from outside districts are lighter. Continued scarcity and relatively high price of cast scrap have prevented many foundries offsetting the inadequate iron supply situation. Foundry coke supply also is tight. Poor quality coke is still another factor retarding foundry operations.

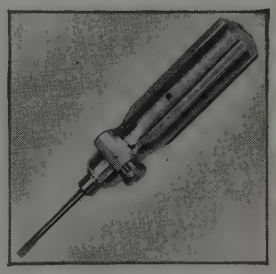
Philadelphia — Pig iron production still falls short of demand, although the vacation season is expected to ease the supply situation somewhat. More foundries will completely suspend operations this year for vacations than ever before, and for a longer average period. Many will go down around the end of this month.

Buffalo — Some of the tightness in the foundry situation has eased, with a few small melters reported looking for business as old orders near completion. However, the leading merchant iron producer reports June tonnage will about equal the movement for the previous month. Concern is noted among machinery casters over the heavy volume of machinery being unloaded by the War Assets Administration. A shipload of pig iron

New Type of Torque Tools Incorporate Spring Clutch!. . . Are 98% Accurate!

Acme Torque Wrench and Screw Driver both incorporate spring clutches, with easily operated control. After setting control to desired torque, the operator merely turns tool in the usual way. When the torque required to drive the threaded part exceeds the pre-set value, the tool slips. Impact doesn't cause driving torque to increase. Oil doesn't affect setting which is reproducible within 2% or better.

The Wrench offers right and left-hand drive, ratchet action and withdrawal. Spring clutch may be set from 0 to 500 inch pounds. Standard sockets are interchangeable. The Screw Driver may be set for any value of torque from 0 to 35 inch pounds. A ratchet action is incorporated. The same tool will also withdraw screws. Standard bits, including socket types, may be easily inserted. The tool is made of pressure cast aluminum.



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AB-64

eared during the week from a local rnace for Detroit.

Chicago — Pig iron and coke continue be the limiting factors in foundry op- ations. While all available merchant n production capacity in this district operating, the output is insufficient to eet melting requirements and suppliers e obliged to maintain close check on ipments to consumers under quotas as- gned. Already there is fear that there ay be an interruption to coal mining ter July 1, which would quickly be lt in restricted iron and coke produc- n. Meanwhile, foundries have found me evaporation of orders on their books customers have found it impossible to aintain production schedules because shortage of steel or other components.

Cincinnati — Receipts of pig iron here e steady but in volume well below de- and. Cut in the castings order back- gs normally might reduce pressure for n deliveries. However, foundries are eking every ton they can get, whether r current needs or as fortification ainst another possible halt in coal min- g.

Birmingham—Apparently resigned to e fact that there will not be enough g iron in the near future to supply rmal needs, many industries which are pendent upon pig iron are operating considerably less than capacity. The strict has quite a few new small foun- ies which have come into being dur- g and since the war and which add the overall need for iron.

St. Louis—Koppers here has returned second blast furnace to operation fol- wing a two-month shutdown for re- ir. Daily output was down to 500 ns, as compared to the 1000 ton ca- city, with 70 per cent of production voted to foundry and malleable iron d 30 per cent to basic.

one Star Steel To Relight last Furnace on Aug. 1

Daingerfield, Tex. — Lone Star Steel o. of Texas will relight the blast fur- ce at its plant here on Aug. 1 and e coke plant will be in full operation July 1, Dr. George H. Anderson, vice esident, has announced. The com- ny will be able to begin operations ithout delay as a result of the release E. B. Germany, trustee, on authority the firm's executive committee, of 1,250,000 of funds received through e sale of common stock and debentures to an operating account.

crap. . .

Scrap Prices, Page 138

Philadelphia — As is usually the case hen there is a turn in the market, scrap ading is on the conservative side, both uyers and sellers moving cautiously. owever, prices generally have moved ward for the second week with deliv- ed prices on No. 1 heavy melting steel $31 to $32 and on No. 2 melting and o. 1 busheling at $29 to $30. No. 1 ndles have advanced to $31 to $32; o. 2 bundles, $27 to $28; No. 3 bun- es, $25 to $26. Machine shop turn- gs are higher at $23 to $24, delivered; ixed borings and turnings, $21 to $22; ort shoveling turnings, $24 to $25; r crops and plate, punchings and plate scrap, and cut structurals, $34.50 to $35.50; electric furnace bundles, $32.50 to $33.50; and heavy turnings, $31 to $32. Cupola cast is $42 to $43; charging box cast, $41 to $42; heavy breakable cast, $40 to $41; unstripped motor blocks, $38 to $38.50; clean auto cast, $42 to $43; and No. 1 wheels, $43 to $44. Malleable cast is unchanged at $50 to $52.

Boston — With a slight advance in open-hearth steel scrap, based on new Pennsylvania buying, consumers are tightening further on inspections. Rejections on some shipments are prevalent. Upward movement carried heavy melting steel $1 higher to $24.25, fob shipping point, while machine shop turnings and short shoveling turnings advanced $1.50 and $2, respectively. Buying of cast grades is light and prices have slumped again. Ship breaking is a minor factor in this area, but several hulls are being cut down to scrap in the Providence, R. I., district, one steel works having purchased several small vessels for this purpose. As a result, this user has been out of the open market.

New York — While brokers' buying prices here are generally unchanged, a strong undertone continues. No. 1 and No. 2 bundles are higher and now on the same basis as No. 1 and No. 2 heavy melting steel with brokers paying $25 to $26, fob shipping point. They have advanced No. 3 bundles about $1 a ton to a spread

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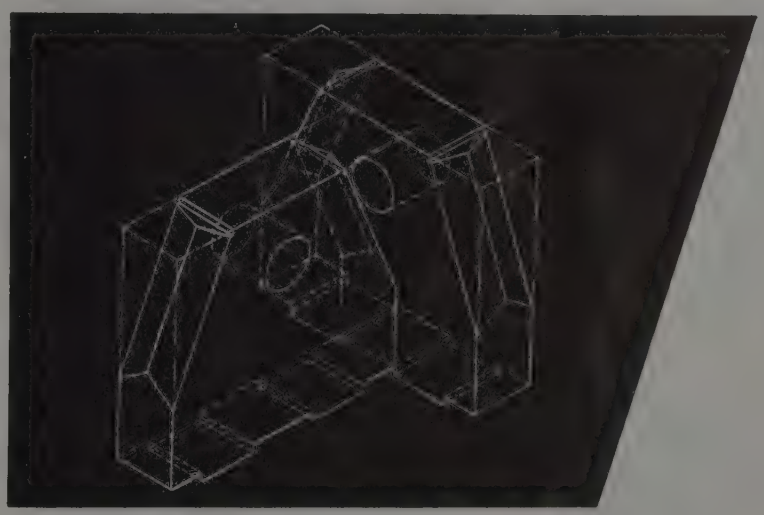

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of $23 to $24. All other grades, including cast iron, are unchanged. New consumer buying has not reached the volume indicated a week or two ago, but interest is keen and the brokers themselves have been active, especially with respect to obtaining tonnage to apply on expiring contracts.

Pittsburgh — Scrap market continues relatively inactive with prices largely nominal in absence of large tonnage purchases. One large consumer is holding up shipments on old $30 orders, while new buying by other interests has been very selective and in small lots. Small quantity of open-hearth scrap has been purchased from remote points ranging up to $32.50 delivered. Fact considerable tonnage continues to move from metal working companies directly to mills has acted as a stabilizing factor on present scrap price levels. Steel foundries are bidding for special quality railroad scrap items, a situation which is said to be a factor in present price differential in heavy melting grades. Cast scrap grades remain in strong demand with prices holding at high levels. Recent purchases of turnings establishes a price range of $26.50 to $27 on machine shop and $29.50 to $30 for short shoveling. Higher scrap prices in the Wheeling-Weirton district, Youngstown area and in the East has resulted in a marked stiffening in price levels here, although there has not been any significant local tonnages sold to warrant an upward revision of present $30 price for open hearth scrap.

Cleveland—Undertone of the scrap market in this district is extremely strong due principally to heavy covering by brokers who are paying $1 to $2 a ton above prices specified in contracts with mills in order to meet commitments. Gains in ingot production, lifting scrap consumption well above anticipated levels, is another important factor contributing to the market's strength. Mills, however, are paying unchanged prices, since they have not closed any new contracts recently. Shipments are holding up well. Railroad scrap is moving at about the same prices as in June, with the exception of No. 1 heavy melting which sold in the Valley recently at $34 to $35, an advance of $2 on the lower side of the range. Demand for foundry grades continues strong.

Buffalo — Strength has returned to the scrap market here following recent weakness. Approximately 15,000 tons of heavy melting and bundles changed hands at $31 to $32 a ton, an increase of $1 to $2 from previous sales. Price upturns were confined to steelmaking grades as cast items were unchanged, reflecting a slight easing in pig iron supplies. While dealers report a gain in yard receipts, the two leading mill consumers report shipments are only equal to current requirements. Dealers' costs continue to mount as leading processors have negotiated new labor agreements calling for wage increases ranging from 10 to 15 per cent. This boosted the common labor rate to a range of 90 to 95 cents an hour in scrap yards. The first boatload of scrap, carrying roughly 5000 tons, arrived from Duluth. The first barge fleet from the seaboard, which was delayed by high waters, docked with about 2500 tons.

Cincinnati—Scrap prices are stronger here, some grades already moving to higher levels. Heavy melting steel is up

at $28 and railroad malleable is up at $44. Borings and turnings have n adjusted upward. So far the situan is largely a reflection of buying in Valley, although local mills are takmodest tonnages. Excessive rains in vicinity have been a factor in reting collections and shipments.

Chicago — Scrap market has assumed tronger undertone. Buying for June very is approaching good volume and eipts of material on old contracts is tinuing steady. Mills are building up entories at a good clip, the intake becomplemented by a substantial vole acquired directly from producers scrap. One complaint, however, is t all of the material is not of top lity, with result that some melting ficulties are being encountered.

Higher prices are quoted on No. 1 ola cast at $37 to $43; malleable and an auto cast, $40 to $45. Confusion sts as to the price of No. 2 heavy lting and No. 2 bundles. Some re- the market as $1 less than the price No. 1 heavy melting steel and No. 1 ndles while others contend these des command the full price quoted No. 1 heavy.

Birmingham — Scrap has tightened ceptibly in the past week. Prices are changed, but a firmer tendency is orted in the more wanted specificaus. Quite a sizable tonnage, however, compared to several months ago, is dent throughout the territory.

St. Louis—Scrap prices here continue fluctuate. Big melters, their reserves 60 days or better, are showing no te to place June contracts and smaller nsumers seldom make commitments il the former set the price levels.

urchased Scrap Use Rises o All-Time High in March

Consumption of purchased scrap during rch increased to 2,185,000 gross tons m 1,872,000 tons in February while e of home scrap increased to 2,401,000 s from 2,148,000 and that of pig iron 4,478,000 tons from 3,988,000, acding to the Bureau of Mines. Conuption of purchased scrap was the aviest since May, 1945.

Steel production in March reached million tons, the largest output since y, 1945, and only 6 per cent lower n the record month of October, 1943. cordingly, consumption of purchased ap, home scrap and pig iron in steel naces increased 18 per cent, 12 per nt and 14 per cent, respectively, over bruary, and the use of purchased ap set an all-time high of 1,577,000 oss tons in March. The relative quantis of scrap and pig iron (47 per cent d 53 per cent, respectively) used in rch, 1947, were identical to those of e record month. However, purchased ap which constituted 18 per cent of e total melt in October, 1943, had inased to 22 per cent in March.

Consumers' stocks of scrap increased 8,000 tons, or 11 per cent, in March a total of 3,005,000 tons from 2,707,-0 at the end of February. Of the rch total, 2,015,000 tons were purased scrap; 990,000 tons, home scrap. nsumers' and suppliers' stocks of pig n at the end of March totaled 694,000 ns compared with 656,000 at the end February and 602,000 at the end of nuary.

Warehouse. . .

Warehouse Prices, Page 135

Cleveland — Some warehousemen received slightly larger tonnages of steel products from mills in May, and in addition easing of demand for several tight products has helped improve their inventory positions. However, one interest reports his allocations for third quarter will stay at about the same level as in first and second quarters. Demand continues strong from fabricators using weldments, although falling off of construction volume recently is starting to be reflected by some easing for structural items handled by jobbers. Demand has declined a little for the smaller carbon bars, one distributor noted, and alloy products rather generally are in normal peacetime supply-demand balance. Consensus of the trade indicates near-normal balance of demand and supply by early fall in many products now short. Notable exception, however, is flat-rolled items which probably will not be in sufficient supply this year to meet demands from all quarters.

New York—More conservative buying is seen in smaller orders placed with warehouses, although the number is sufficient to maintain volume close to recent levels. For the so-called critical supply products, demand is in excess of stock available; these include flat-rolled and wire products, structurals, plates and pipe. Inability of distributors to

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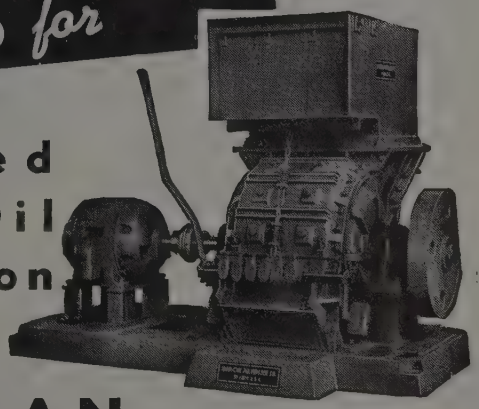

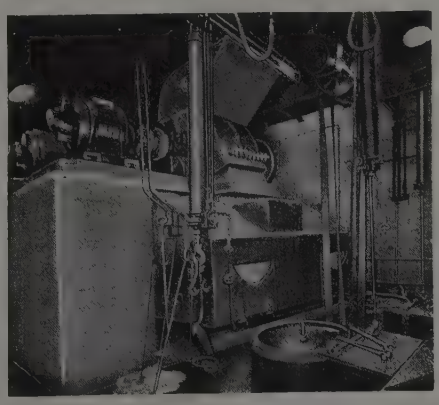

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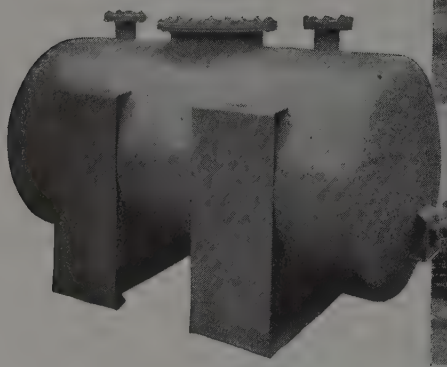

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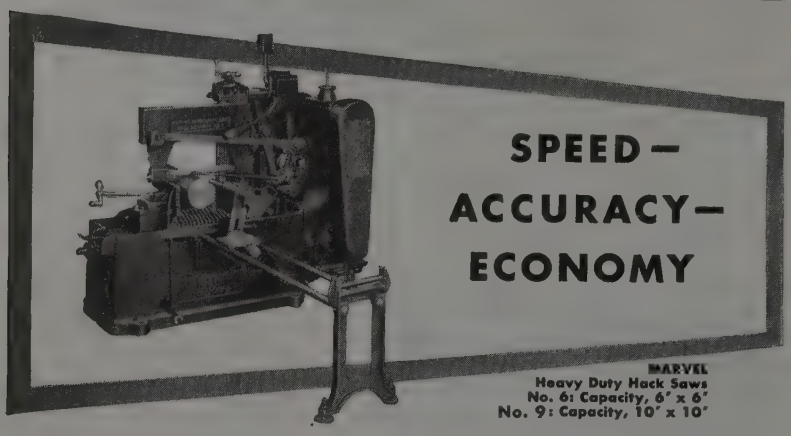

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place orders beyond third quarter allocations which are no heavier than the current rate, precludes substantial improvement in tightest products during the next few months. Nail quotas for July are reduced with some. Only on carbon bars in more sizes, but not on the smallest, are prospects for more tonnage enhanced among standard carbon products.

Boston—Inventories on most carbon steel products are low, thus limiting sales. Outlook for heavier replacements in third quarter is unimproved on most items with the possible exception of bars. This stringency prevails for the most part in carbon steels for which demand is strongest; alloys, stainless, tool steel, and specialties are available to meet demand which is off 10 per cent from first quarter with some distributors. Buying of carbon goods is in smaller lots, but the overall slack is not as great. Especially short are structurals, warehouse allocations being reduced or blanked out for short periods by more producers.

Pittsburgh — Shipments of steel from warehouse stocks were sharply curtailed recently because of the local AFL-Teamsters' strike. Considerable tonnage was rerouted by rail while many consumers were forced to pick up badly needed steel items in their own trucks. No let-up in demand is noted by steel distributors, and little improvement has developed in mill deliveries. Unusually low inventory position of most warehouses is not a true criterion of the extent of mill shipments because stocks are turned over at much faster rate than normal. Warehouse inventories of plates, shapes, small sized carbon bars, and sheets and strip are badly depleted; supply of most alloy items, cold-finished bars and mechanical and pressure tubing has been augmented recently.

Philadelphia — Jobbers report a slight decline in May orders from the April peak and anticipate a further and more substantial drop this month, due chiefly to suspensions at various customers' plants for vacations, beginning the latter part of June.

Chicago — Chicago warehouses now are quoting hot-rolled and cold-rolled sheets on the simplified basis of fixed mark-up over mill base prices plus extras for gage.

Iron Ore. . .

Iron Ore Prices, Page 134

Cleveland — American Great Lakes fleet of ore vessels numbered, as of May 15, 273, of which 270 or 98.9 per cent, were commissioned, according to M. A. Hanna Co., this city. Vessels in the ore trade numbered 260 while 10 were carrying other commodities. The tonnage in commission on that date was 2,655,650 tons per trip, representing 95.39 per cent of the total trip capacity of 2,679,350, based on 20-foot draft.

On Sept. 15 of last year, 262 vessels were in the ore trade out of a total of 268 in commission and 269 in the fleet. Tonnage in commission was 2,642,950, representing 99.62 per cent of the trip capacity of 2,653,050.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 134

Pittsburgh — Installation of additional coke ovens later this year should ease

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by-product coke shortage somewhat. However, most producers expect to continue present policy of allocating limited tonnage available through most of this year. Foundry coke inventories are well below normal, although operations are not retarded because of this factor except from point of view of poor quality coke. Until present UMW contract negotiations are consummated and extent of increased coal mining costs determined, no significant adjustment in coal and coke prices is probable. However, some sales of Connellsville beehive foundry coke recently have been made at $11.50 per net ton; making the price range $9.75 to $11.50, up 50 cents a ton at the higher end of the range.

Construction is expected to get under way this month on a $3 million coal conversion plant and tar refinery for the Disco Co., subsidiary of Pittsburgh Consolidation Coal Co. This project is considered an important step toward more complete utilization of bituminous coal, for the plant will make a smokeless solid fuel and will refine coal tar into a number of chemicals.

Canada . . .

Toronto, Ont. — Canadian prices on the heavier lines of steel, including sheets, plates and bars, are unchanged from levels established in April, 1946, but advances have been permitted in some of the lighter materials, and on many lines extras have been moved upward.

Wartime Prices and Trade Board has authorized an increase in the manufacturers' nail prices of 50 cents per 100 pound keg, in an effort to step up production to an average of 6500 tons monthly. This means an advance to the consumer of 70 cents per keg, and represents an advance of $10 per ton in the price of steel going into nail production. Effective April 15, price of pig iron was advanced $6.50 per ton in Canada.

Government officials announced no revision will be made in scrap prices, which were last changed in 1942. However, officials point out that the flow of scrap to the steel mills has been very slow, and urge all dealers to exert every effort to increase the flow of scrap to the mills. Dealers state that their receipts are almost negligible and that prevailing prices are no inducement for any widespread collection of scrap throughout the country. Collectors point out that under present prices there is no profit in seeking out the scrap from the farm communities, although there are big tonnages available from these sources. Steel mills have given up hope of obtaining large tonnages of scrap in Canada and have placed big orders for importation of battlefield scrap in Europe.

While iron and steel production is being maintained at a high rate, there has been comparatively little easing in the supply position. Inquiries for steel are pouring in and new order placing has broadened recently with books now open for third quarter delivery. However, on the more popular lines, producers continue to hand out supplies on a quota basis. While this policy enables most consumers to maintain operations at a steady pace, the available steel supply is not sufficient to provide raw materials for capacity production.

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ports from the United States have increased. Imports of iron and steel and their products for the month of March were valued at $60,424,000 compared with $29,979,000 for March, 1946. The most pronounced gains were in rolling mill products, farm implements, machinery, automobiles and parts, engines and boilers. Of the total merchandise imports into Canada during March of $208,900,000, the United States was responsible for $165,487,000.

Builders' Hardware Industry Goes Into Mass Production

(*Concluded from Page* 59)

dividual contracts are placed for both types of structures, Rockefeller Center and the Empire State building, New York, and other large units. One of the largest, now in production, is the contract for hardware required by the Metropolitan Life Insurance Co.'s three housing projects, New York; these are Stuyvesant Town, Peter Cooper Village and Riverdale.

For the 12,482 apartments in the 68 buildings, more than $500,000 worth of hardware, wrought and cast brass and bronze, will be installed. Norwalk Lock Co., Norwalk, Conn., is supplying this hardware.

Builders' hardware being a precision and high tolerance industry to considerable degree, most shops went over heavily in wartime to precision instruments, equipment and ordnance. At end of the war, this industry went well beyond its former status in reconversion, but not without difficulties in obtaining new equipment and materials and in labor troubles. Currently the stage is set for meeting heavy demand with mass production for several years ahead.

Numerous plants also make other types of hardware, including marine, motor vehicle, railway car, aircraft and furniture among others. Under the heading of general hardware there are 128 plants. As stated, 57 make builders' hardware, 41 transportation equipment hardware, while 53 produce other general hardware. Production this year thus far is close to 20 per cent higher than in the last six months, 1946, when output really started to roll. Increased operating efficiency and improved machinery rather than large expansion in plant space is making for higher output, coupled with the elimination of many items bordering on duplication. Number of different items in some cases is cut as much as two-thirds.

Demand currently is centered in lower and medium cost pieces, reflecting emphasis on more inexpensive dwellings in the housing program. Ornamental hardware in brass and bronze of fancy design for the moment is lagging. Because of earlier scarcity of brass and bronze, most manufacturers fortunately are not heavily committed for better quality higher priced goods. Shortages and high cost of iron castings has opened some applications for aluminum. Incidentally, the automobile industry is going strong to aluminum keys next year.

On the whole, materials supply is improving, but large producers of a full range of builders' hardware require a wide range of sizes and grades in the same finished steel product, as many as 1500 different sizes and grades of rods and bars in some cases. Plastics are creating little excitement for hardware; only for possible elaboration in some designs and trim are plastics likely to come into the scene.

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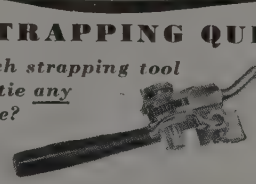
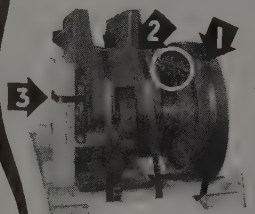
Q. *Which strapping tool will tie any shape?*

A. *The* STEELBINDER

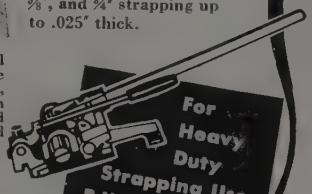


only tool that ties round, square or irregular objects of any size



The Steelbinder works with no part under the strap...*no slack* when the tool is removed. That's why it's the *only* tool for round shapes and why it "ties a tighter tie" on any shape. Also, only the Steelbinder handles ¾", ½", ⅝", and ¾" strapping up to .025" thick.

• Steelbinder Steel Strap binds three types of surfaces (1) round, (2) irregular, (3) square, on one stamping press. Circled area indicates parts strapped on the machine.



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9

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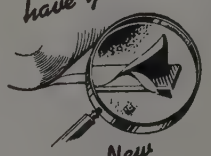

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Applied *directly* on painted or enameled surfaces.

•

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free sample!

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3020 tons, sheet piling, power house, Illinois Power Co., Wood River, Ill.; 1520 tons to Carnegie-Illinois Steel Corp., Chicago, and 1500 tons to Bethlehem Steel Co., Bethlehem, Pa.

950 tons, plant addition, A. G. Spaulding & Bros. Inc., Chicopee, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; J. W. Harris Associates Inc., New York, engineers.

390 tons, fine arts building, University of Illinois, Urbana, Ill., to Midland Structural Steel Co., Chicago, for fabrication by Allied Structural Steel Cos.

350 tons, cancer research building, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

325 tons, Navy storehouse, Mechanicsburg, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, plant addition, Standard Steel Works, Burnham, Pa., to American Bridge Co., Pittsburgh.

300 tons, addition to building X, Caterpillar Tractor Co., Peoria, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Fred Harbers Sons, Peoria, Ill., contractor.

250 tons, power plant extension, Eastern Shore Public Service Co., Vienna, Md., to Maryland Steel Products Co., Baltimore.

210 tons, addition to building No. 210, Colgate Palm Olive Peet Co., Jeffersonville, Ind., through Turner Construction Co., Philadelphia, to Whitehead & Kales, Detroit.

204 tons, Rocky Point bridge, Washington state, to Pacific Car & Foundry Co., Seattle.

203 tons, highway bridge FI-142(17), Winnebago county, Illinois, for State Highway Department, to Duffin Iron Co., Chicago.

180 tons, alterations to plant 2, Oliver Corp., South Bend, Ind., to Elkhart Bridge & Iron Co., Elkhart, Ind.

175 tons, power station, Farley & Loetscher Mfg. Co., Dubuque, Iowa, to Clinton Bridge Works, Clinton, Iowa, for fabrication by Allied Structural Steel Cos.; Laramore & Douglass, Chicago, engineers.

170 tons, swine pavilion, Indiana State Fairgrounds, Indianapolis, to International Steel Co., Evansville, Ind.

160 tons, women's residence hall, University of Illinois, Urbana, Ill., to United Boiler Heating & Foundry Co., Hammond, Ind.; Warner Construction Co., Chicago, contractor.

150 tons, reconstruction of state bridge, Luzerne county, Pennsylvania, to Pine Brook Iron Works, Scranton, Pa.

130 tons, highway bridge, Adrian, Mich., for State Highway Commission, to Yeager Bridge & Culvert Co., Detroit; Ruckman Hanson Inc., contractor.

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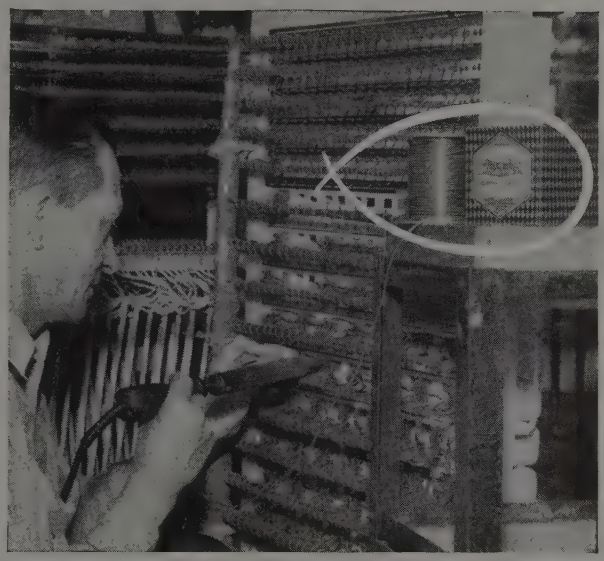

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● Kester Cored Solders are available in a wide range of strand and core sizes, with the right combination of alloy and flux to give you the right solder for your specific job.

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Specialized Industrial Cleaning
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Rocks canal, U. S. Engineers Office, St. Louis; bids over estimate, rejected; new bids May 28.

2735 tons, state bridge, Luzerne county, Pennsylvania, bids June 20.

1200 tons, 1352-foot Clearwater river state bridge, Lewiston, Idaho; low bid of $955,167 by Paul Jarvis, Seattle, $100,000 over estimate and rejected; project indefinitely postponed.

1100 tons, including reinforcing, Washington state Northport bridge; bids to Olympia, June 10.

800 tons, E. 83rd St. subway substructure and superstructure, Department of Public Works, Chicago; bids June 17.

725 tons, bridges, route 44, section 9B, West Deptford township, N. J.; bids June 25 to state highway commissioner, Trenton, N. J.

725 tons, state bridge, Gloucester county, New Jersey, bids June 25.

700 tons, beam spans, Temple, Tex., for State Highway Commission.

624 tons, bridge, Lawrence county, Arkansas, for State Highway Commission.

500 tons, beam span, Redwood, Miss., for State Highway Commission.

400 tons, bridge contract 2812, Ft. Wayne, Ind., for State Highway Commission; bids June 3.

400 tons, building, Electro Metallurgical Co., Emco, Ala.

300 tons, public school, Edgemoor, Del., bids June 26.

280 tons, state bridge, Jefferson county, Pennsylvania, bids June 20.

250 tons, building, Aetna Steel Products Corp., Pottsville, Pa., bids June 9.

250 tons, extension to turbine test building No. 633, Navy yard, Philadelphia, bids June 12.

220 tons, bridge contract 2814, Cutler, Ind., for State Highway Commission; bids June 3.

206 tons, bridge contract 2813, Rickville, Ind., for State Highway Commission; bids June 3.

200 tons, Monsanto Chemical Co. plant, Seattle; general contract to H. S. Wright, Seattle.

175 tons, including reinforcing, state bridge, Clark county, Washington; bids to Olympia, June 10.

150 tons, addition, Container Corp. of America, Philadelphia, bids June 13.

125 tons, school, Holyoak, Del., bids June 26.

Unstated, three 52-foot steel beam spans; bids to Oregon Highway Commission, Portland, Oreg., June 17.

REINFORCING BARS . . .

REINFORCING BARS PLACED

425 tons, cooler, Quincy Market Cold Storage & Warehouse, Boston, to Truscon Steel Co., Boston.

140 tons, buildings, Drake University, Des Moines, to Bethlehem Steel Co., Bethlehem, Pa.; A. H. Neuman Co., Des Moines, contractor.

105 tons, substructure, fixed highway bridge over Calumet river at 130th St., Chicago, for Department of Public Works, to Ceco Steel Products Corp., Cicero, Ill.; Great Lakes Dredge & Dock Co., Chicago, contractor.

REINFORCING BARS PENDING

754 tons, experimental test slab, State Highway Department, Illinois.

750 tons, Addison St. sewer system, Department of Public Works, Chicago; Michael Pontarelli & Sons, Chicago, low on general contract; bids May 28.

600 tons, veterans hospital, Miles City, Mont., for U. S. Veterans Administration; bids June 6.

420 tons, mesh and bars, highway and bridges, route 44, section 9B, West Deptford township, N. J.; bids June 25, state highway commissioner, Trenton, N. J.

250 tons, store, Sears Roebuck & Co., Erie, Pa.

180 tons, New Jersey state highway bridge, Gloucester county, bids June 25.

196 tons, Ridge-Davis apartment, Evanston, Ill.

127 tons, nurses home, Swedish Covenant hospital, Chicago; bids June 5.

Unstated, accelerator building, University of Chicago, Chicago; bids June 2.

Unstated, E. 83rd St. subway substructure and superstructure, Department of Public Works, Chicago; bids June 17.

Unstated, Healthwin hospital addition, St. Joseph, Mich.; bids June 22.

PLATES . . .

PLATES PLACED

400 tons, 16-inch steel water pipe, Bow Lake airport, Seattle, to Hydraulic Supply Co., Seattle.

Unstated, seven 72-inch valves for Anderson Ranch dam, Idaho, to Newport News Shipbuilding & Drydock Co., Newport News, Va.

PLATES PENDING

Unstated, 66-inch steel pipe line; plans being prepared by Seattle water department for $1½ million improvement.

Unstated, surge tanks, 1500 ft penstock, etc., for hydroelectric facility, Toketee Falls, Oreg., for California-Oregon Power Co.; bids in June.

PIPE . . .

CAST IRON PIPE PLACED

680 tons, 14 to 16-inch system expansion, Coos Bay, Oreg., to H. G. Purcell, Seattle, for United States Pipe & Foundry Co., Burlington, N. J.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Central of New Jersey, three 2000-horsepower diesel-electric passenger locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Chicago & Northwestern, 21 diesel-electric switch engines of varying horsepower, with 10 to Fairbanks, Morse & Co., Chicago; 8 to American Locomotive Co., New York, and 3 to Baldwin Locomotive Works, Eddystone, Pa.

Minneapolis, St. Paul and Sault Ste. Marie, ten 3000-horsepower diesel-electric locomotives; purchase approved by directors, with builder not announced; these are in addition to eight 1500-horsepower diesel-electric switch engines recently noted as placed with the Baldwin Locomotive Works, Eddystone, Pa.

Santa Fe, 25 diesel-electric locomotives with eight to Electro-Motive Division, General Motors Corp., La Grange, Ill.; eight to American Locomotive Co., Schenectady, N. Y.; seven to Baldwin Locomotive Works, Eddystone, Pa.; two to Fairbanks, Morse & Co. at Beloit, Wis.

United Fruit Co., eight 2-8-2 type steam locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

RAILROAD CARS PLACED

Chicago Great Western, 14 diesel yard switching locomotives, five to American Locomotive Co., New York, and nine to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Duluth, Mesabi & Iron Range, 2000 seventy-ton hopper cars, with 500 each going to American Car & Foundry Co., New York; the Pressed Steel Car Co., Pittsburgh, Pullman-Standard Car Mfg. Co., Chicago, and the General American Transportation Corp., Chicago.

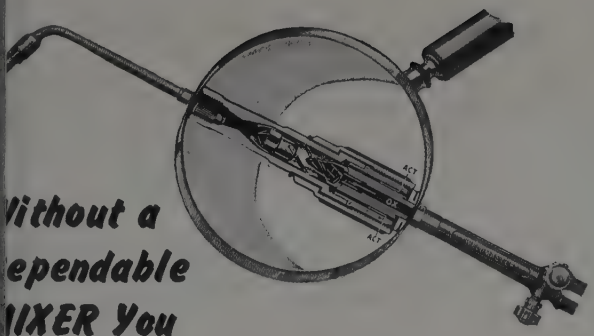
Louisville & Nashville, 3000 hopper cars, reported as divided equally between Pullman-Standard Car Mfg. Co., Chicago, and Pressed Steel Car Co., Pittsburgh.

New York Central, 2000 fifty-ton box cars, with 1000 going to American Car & Foundry Co., New York, and 1000 to the Greenville Steel Car Co., Greenville, Pa.

New Jersey, Indiana & Illinois, a subsidiary of Wabash, 100 fifty-ton auto cars, to an unnamed builder.

RAILROAD CARS PENDING

Lehigh & Hudson River, 20 seventy-ton covered hopper cars for the transportation of zinc ore; bids closed June 4.



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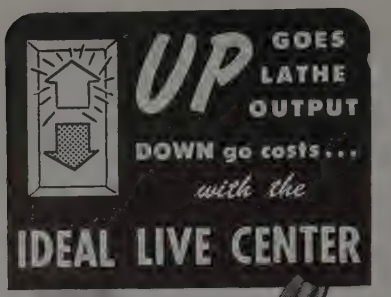
WHEELING, WEST VIRGINIA



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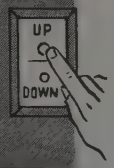

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CONSTRUCTION AND ENTERPRIS

CALIFORNIA

LOS ANGELES—Aluminum Fabricators Inc. has been formed by Henry P. Cebo and associates. Firm is represented by Harold S. Kiggens, 226 North Beaudry Ave.

LOS ANGELES—American Implement Corp. has been formed by Austin E. Elmore and associates to engage in manufacturing and selling. Firm is represented by Robert L. Ferguson, 1237 Citizens National Bank Bldg.

LOS ANGELES—Wochner Tool Co. has been incorporated by Elmer E. Wochner to manufacture and sell dies, tools and machine shop products. Firm is represented by Julian H. Weiss, 903 Union Bank Bldg.

LOS ANGELES—Flex-Tite Coupling Corp. has been formed by James M. Montgomery and associates with a capital of $200,000 to manufacture and deal in couplings, clamps, joints, fittings and parts. Firm is represented by Faries & McDowell, 812 Subway Terminal Bldg.

OAKLAND, CALIF. — Aluminum Cooking Utensil Co., 45th and Adeline Sts., has awarded a contract to Swanstrom & Stahl, 2034 Hoover Ave., for a warehouse addition. Cost is estimated at $283,354.

CONNECTICUT

WEST HARTFORD, CONN.—Walton Co., 94 Allen St., Hartford, has awarded a $60,000 contract for a 1-story, 80 x 150 ft factory to Bartlett Brainerd Co., 103 Woodbine St., Hartford. Architects are Moore & Salisbury, 998 Farmington Ave. Engineers are Buck & Buck, 650 Main St., Hartford.

DELAWARE

WILMINGTON, DEL.—North American Smelting Co., Tioga and Edgemont Sts., Philadelphia, has awarded a $75,000 contract for additions and alterations to 12 of its plant buildings to Beaver Construction Co., 1718 Cherry St., Philadelphia.

ILLINOIS

CHICAGO—Kelite Products, 315 W. Hubbard St., has awarded an $85,000 contract to Algot B. Larson, 3837 W. Lake St., for a 1-story factory.

CHICAGO—Western Printing Machinery Co., 430 S. Green St., will build a $67,000 factory. Architect is Klefstad Engineering Co., 3600 W. Fullerton St.

MICHIGAN

DETROIT—C. A. Roberts Co., 2460 Bellevue Ave., has awarded a $65,000 contract to Clausen Co., 5415 Cass Ave., for a warehouse for tubing storage.

MISSOURI

KANSAS CITY, MO.—Kansas City Brass Co., 1500 Dierks Bldg., has been incorporated by F. L. Beeson and associates to deal in metal products.

NEW MARKET, MO.—Carter-Waters Corp., 2440 Pennway, Kansas City, Mo., will construct a kiln, office building and warehouse here. To cost about $100,000 with equipment, the facility was planned and engineered by Archer, Cooper & Robison, Commerce Bldg., Kansas City, Mo.

ST. LOUIS—Walsh Refractories Corp., 4070 N. First St., has received OHE approval for a $127,500 addition to its plant here.

ST. LOUIS—General Cable Corp., 4121 North Kingshighway Blvd., has received OHE approval for a $250,000 addition to its plant here.

ST. LOUIS—Progress Electric Corp., 18 W. Big Ben Rd., has been incorporated by M. A. Watson and associates as an electrical installation and supply business.

ST. LOUIS—Thurmaduke Corp., 2305 N. Broadway, has awarded a $55,000 contract to Murch-Jarvis Co., 718 Locust St., for a 1-story factory addition, 115 x 140 ft.

ST. LOUIS—J. A. Weaver, 2110 Howard has awarded a contract to Charles Thurs 7800 Well Ave., for a shop and foundry cost $55,000 including equipment.

SENECA, MO.—Caroline Products Co. awarded a $400,000 contract to Fogel C struction Co., 1212 E. Eighth St., Ka City, Mo., for a 1-story, 140 x 354 ft pl Engineers are K. H. Larkin & Associates, Wirthman Bldg., Kansas City, Mo.

OHIO

BELLEVUE, O.—Ohio Cultivator, division National Farm Machinery Co-operative Inc building a 30,000 sq ft factory, 65 x 480

CLEVELAND—Wire Coating & Mfg. Co. been formed by Robert T. Hendrichs, 395 131st St., to plate wire and metals.

CLEVELAND—Ranier Inc., 1220 W. 6th has been formed by Charles A. Fos Formerly named Steel Equipment Co., firm distributes nails, wire goods and s bandings.

MANSFIELD, O.—Roget Castings Inc., Longview Ave., has been formed by Will R. Badgett with capital of $50,000 as a casting business.

OREGON

PORTLAND, OREG. — Electro Metallurg Co., 30 E. 42nd St., New York, has awar a $66,000 contract to Donald M. Drake C struction Co., Lewis Bldg., for a 1-story wa house, 20 x 120 ft.

PENNSYLVANIA

BRISTOL, PA.—All-Lite Metal Window Bath Rd., has awarded a $56,000 contract S. J. Leeper, Morrisville, for a 1-story, 5 200 ft factory. Architect is W. H. Robe 20 N. Pennsylvania Ave., Morrisville.

CALIFORNIA, PA.—Jones & Laughlin S Corp., Pittsburgh, has awarded a $125,(contract to McNally Pittsburgh Mfg. Co Bessemer Bldg., Pittsburgh, for the des and construction of a coal washer and tip

CHARLEROI, PA. — Corning Glass Wo Corning, N. Y., has awarded a contract Rust Engineering Co., 280 Corliss St., Pi burgh, for additions to its furnace build and a 135 ft radial chimney. Company manufacture television bulbs.

PHILADELPHIA—Westinghouse Electric Co Pittsburgh, plans to construct a combinat building at 30th and Walnut Sts., at a of $825,000. Architect is G. H. Parkm c/o owner.

PITTSBURGH—Crucible Steel Co. has awar a $100,000 contract to Pittsburgh Bridge Iron Co., Union Bank Bldg., for a 1-story, x 400 ft conditioning building.

CANADA

SEVEN SISTER FALLS, MAN.—Winni Electric Co., Winnipeg, plans completion power project and plant here to cost w equipment about $2,306,000.

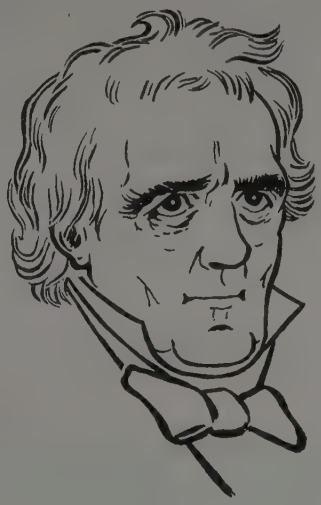
MACCAN, N. S.—Canada Electric Co., A herst, N. S., has completed plans for c struction of power plant here to cost $300,0

FERGUS, ONT.—Beatty Bros. Ltd., manuf turer of farm equipment and stoves, is hav plans prepared for construction of plant dition to cost about $50,000.

OTTAWA, ONT.—International Harvester of Canada Ltd., 208 Hoolyard St., Hamilt has awarded a $400,000 general contract Ross Meagher Ltd., 9 Echo Dr., for c struction of plant here. Architects are Ha grove, Lithwick & Cameron, 53 Queen St

PRESTON, ONT.—Groh Cooler Ltd., Laurel St., maker of electric milk cool equipment, plans construction of plant ad tion to cost about $60,000. Architects Barnett & Reider, 49 King St. E., Kitchen

MONTREAL, QUE.—Zinc Oxide Co. of C ada Ltd., 6894 Notre Dame St. E., is hav plans prepared by Ludger Venne, archite 3607 St. Denis St., for construction of pl to cost about $500,000.



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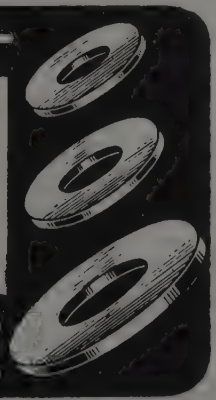

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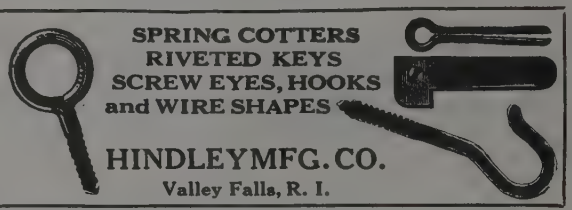

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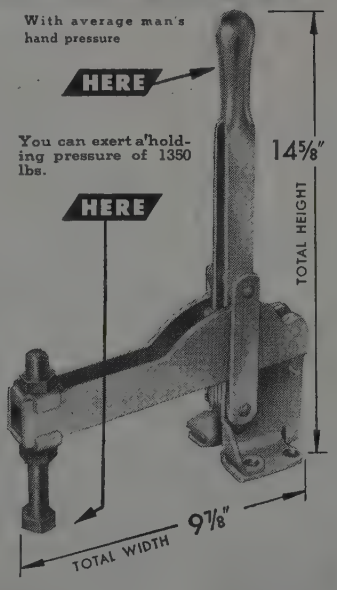

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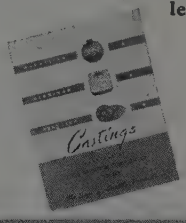

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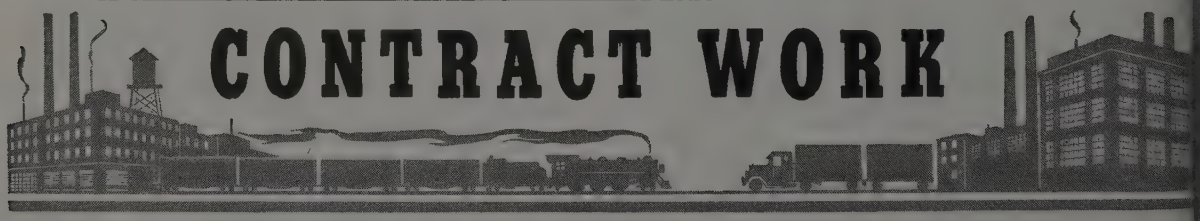

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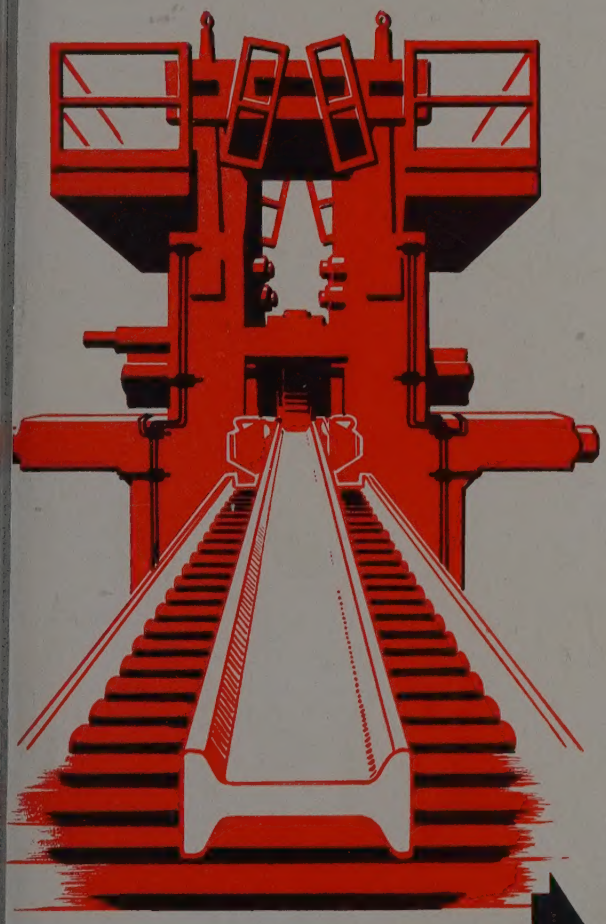
No more shutdowns from uneven bearing wear

BECAUSE of uneven wear on the bearings, due to improper lubrication, a 48″ structural mill had to be shut down every two hours for tightening up. Bearing life was never more than 55,000 tons.

Then a Farval Centralized Lubricating System was installed. Bearing life was more than tripled. On a test run 168,000 tons of steel were rolled with one set of bearings. With proper lubrication, there was no longer any need to insert liners under the bearings to balance the mill. Farval paid for itself in a few weeks—in the savings realized in labor, lubricant and worn-out bearings. Even greater savings came from the increased output which resulted from eliminating the former shutdowns required for tightening up.



Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, at regular intervals. Farval is the Dualine System with the Positive Piston Displacement Valve. This valve has but two moving parts and is fully adjustable, with a Tell-tale indicator at each bearing to show the job is done. For a full description of Farval, write for Bulletin 25, The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

FARVAL—*Studies in Centralized Lubrication No. 95*

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing.
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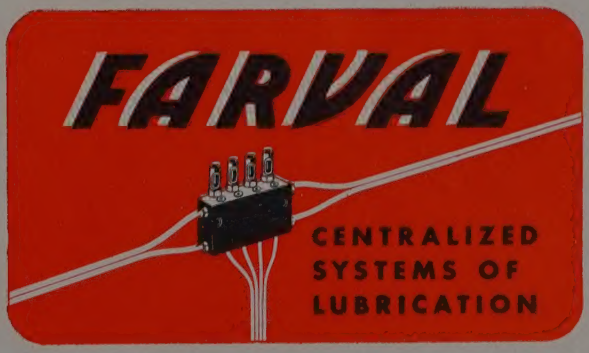

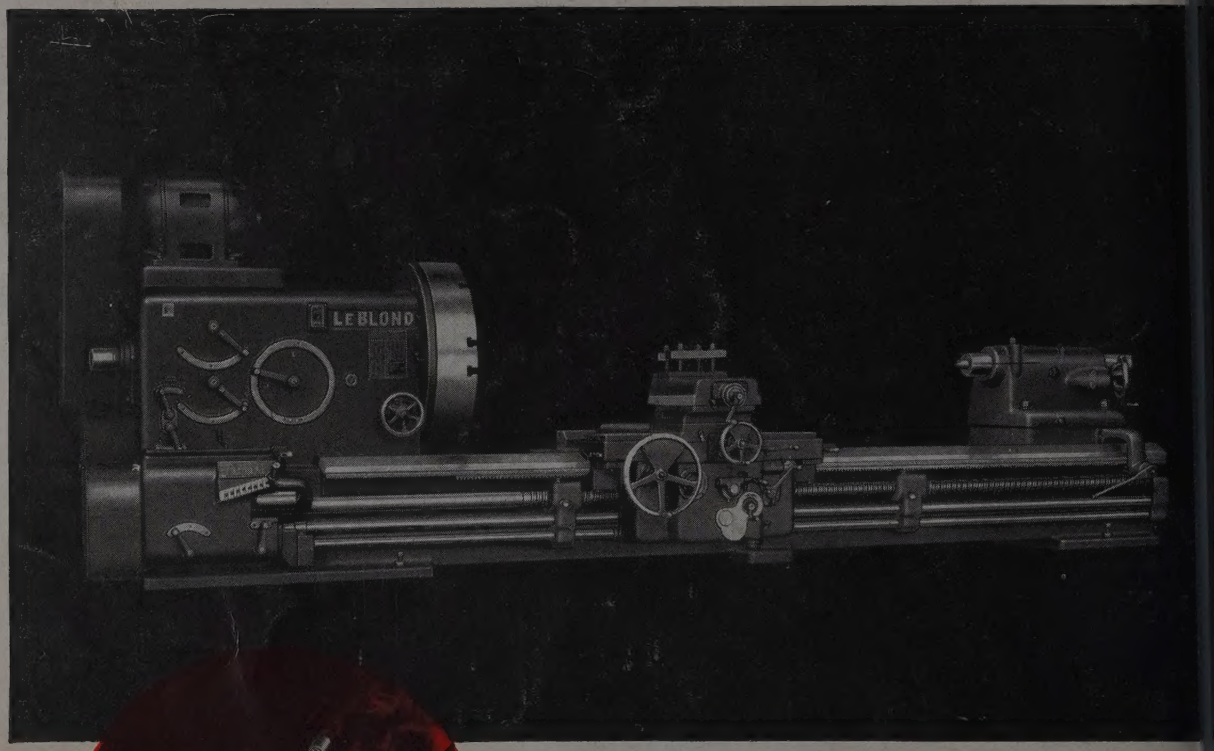

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